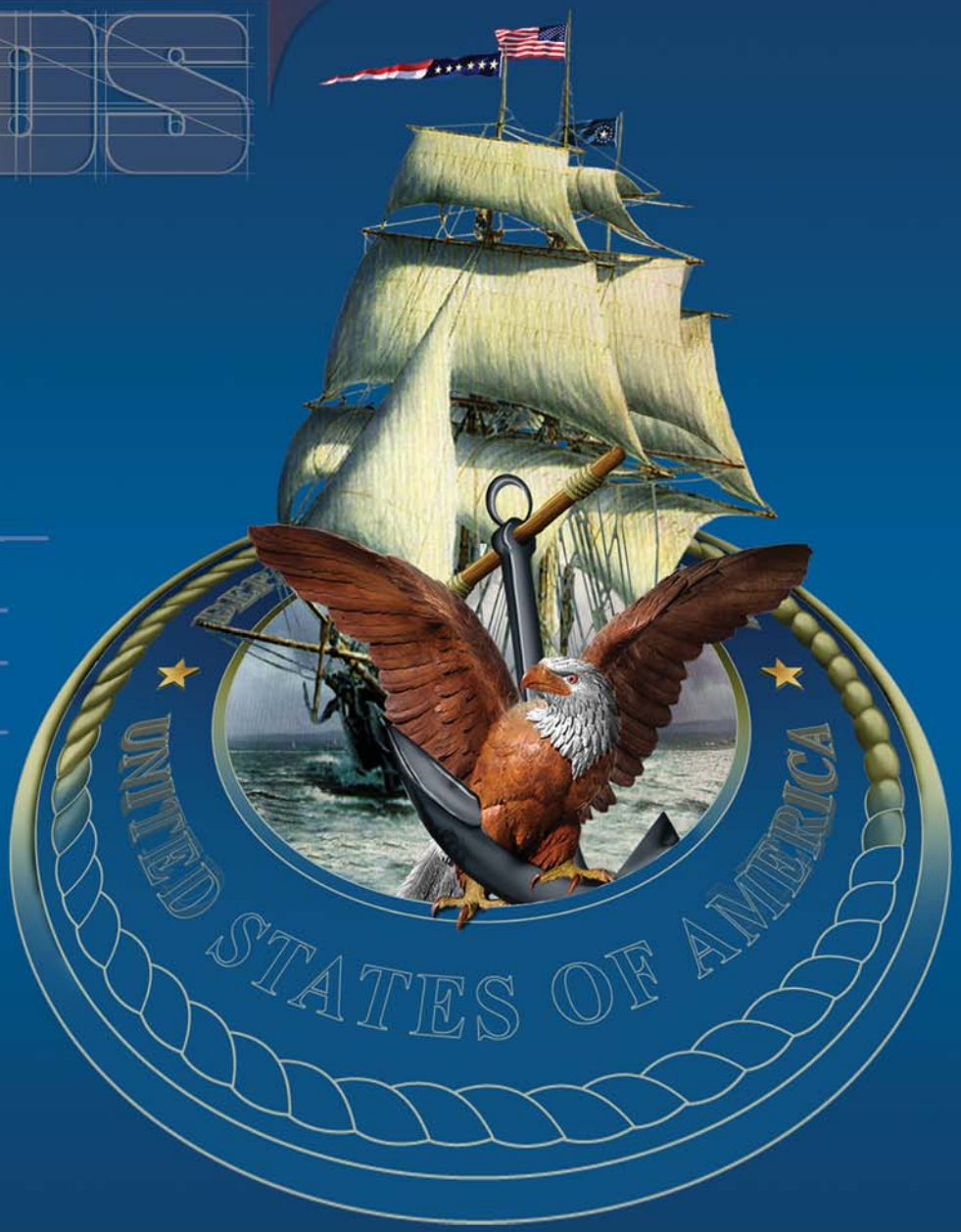
JANUARY

All Hands

MAGAZINE OF THE U.S. NAVY

OWNER'S & OPERATOR'S MANUAL 2007



[On the Front Cover]
Cover graphic by MC2 Washington Caicedo.

[Next Month]
All Hands travels to Jordan to cover a joint EOD exercise.

All Hands (USPS 372-970; ISSN 0002-5577) Number 1077 is published monthly by the Naval Media Center, Publishing Department, 2713 Mitscher Rd. S.W., Anacostia Annex, D.C. 20373-5819. Periodicals postage paid at Washington, D.C., and at additional mailing offices. **Subscriptions:** For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 or call 202/512-1800. Subscription prices $45 (domestic)/$54 (foreign); $7.50 (single copy domestic)/$9 (single copy foreign). **Postmaster:** Send address changes to All Hands, Naval Media Center, Publishing Department 2713 Mitscher Rd., S.W., Anacostia Annex, D.C. 20373-5819 **Editorial Offices:** Send submissions and correspondence to Naval Media Center Publishing Department, ATTN: Editor, 2713 Mitscher Rd., S.W., Anacostia Annex, D.C. 20373-5819 Tel: DSN 288-4171 or 202/433-4171 Fax: DSN 288-4747 or 202/433-4747 E-Mail: allhandsmagazine@navy.mil Message: NAVMEDIACEN WASHINGTON DC //32// **Authorization:** The Secretary of the Navy has determined this publication is necessary in the transaction of business required by law of the Department of the Navy. Funds for printing this publication have been approved by the Navy Publications and Printing Committee.

January

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The Navy Professional Reading Program list can be found on the world wide web at www.navyreading.navy.mil.

The program includes five 12-book collections with subjects focused on leadership, military heritage, joint warfare, cultural awareness, critical thinking and management. They include award-winning histories, biographies, novels, business bestsellers and more.

CNO's Introduction

Welcome to the 2007 edition of the *All Hands* "Owner's and Operator's Manual." As always, you'll find a wealth of information about your Navy right inside. From base pay to base installations, ship classes to aircraft types, it's all here in one easy-to-use format. There's simply no better one-stop shop for information about our Navy than this single issue of *All Hands*.

I urge you to read it, save it, and share it with your shipmates. Now is the time to stay up to speed. With so much happening in the world today, we simply can't afford to take our eyes off the horizon for even a moment.

Consider just a few of the things we witnessed since the last "Owner's and Operator's" went to press: Iran moved forward with plans to enrich uranium; North Korea tested a nuclear device; the Taliban continued its resurgence in Afghanistan; Israel and Lebanon battled one another; pirates stepped up attacks off Africa; and our nation remained at war – not just in Iraq – but around the world.

We've been a big part of that war, a big part of this rapidly changing world. We didn't just watch things happen. We helped shape them.

As one Sailor serving in Iraq, Electronics Technician 1st Class (SW) Brian Pintello, put it: "You see and hear about service members doing their part out here in harm's way. I wanted to make a difference. I wanted to play my part."

We have all played our part.

The Navy took command of the detainee mission in Guantanamo Bay and the Joint Task Force in the Horn of Africa. We helped provide security for Iraqi oil platforms in the Persian Gulf, completed a series of successful sea-based anti-ballistic missile tests, and sent the hospital ship USNS *Mercy* (T-AH 19) on a five-month humanitarian mission to Indonesia, Bangladesh and the Philippines.

We helped chase down pirates and build up communities at home and abroad that were devastated by natural disaster. Navy officers commanded six of 12 U.S.-led Provincial Reconstruction Teams in Afghanistan, and, alongside the Marines, we evacuated some 14,000 American citizens from Lebanon.

Even as this issue goes to press, more than 30,000 Sailors remain deployed. Thirteen thousand of them are on the ground in the Central Command AOR, which is more by a thousand than those serving at sea in the same theater. A good many are Individual Augmentees, Sailors like Pintello, who we send forward to fill critical billets in joint and coalition units.

Theirs is a special contribution, requiring a special sacrifice by families and loved ones. We are grateful for them and to them all. They know the risks of complacency, the high stakes for freedom. They know that what matters most is not the busy year we just had, but the busy year we are about to have.

As you continue to operate this Navy you own — the Navy you can read about in this issue — please remember how much your talent remains in demand and for whom and for what you're really striving.

"I have four daughters back home," added Pintello. "I hope my actions here will ultimately make the world a better place for them."

His actions will. Your actions will. It's all about the future, yours and your family's ... ours and the world's. With our eyes firmly on the horizon, we must shape it together.

All Hands

[Number 1077]

Number 1077 • January 2007
www.navy.mil

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All Hands

Recipient of the Thomas Jefferson Award for magazine excellence in 2005.

Unified Command

NAVAL COMPONENT COMMANDS AND NUMBERED FLEETS

The map depicts the Unified Commands having geographic areas of operation (AO). The Navy supports those regional Unified Commands with component and numbered fleets.

U.S. NORTHERN COMMAND (NORTHCOM)

U.S. Fleet Forces Command

Headquarters: Norfolk
Mission: Fleet Forces Command (FFC) organizes, mans, trains and equips Navy forces and provides planning support to combatant commanders; deters, detects and defends against homeland maritime threats; and articulates fleet war-fighting and readiness capabilities to the Chief of Naval Operations (CNO). Fleet Forces Command strives to have an effectively prepared total Navy force, ready to win in combat; to authoritatively define consistently accepted fleet readiness and war-fighting capabilities; and to provide transformational change through Concept of Operations and doctrine development, and agile, powerful and persistent Navy forces and operational planning from combatant commanders to the Chief of Naval Operations.

U.S. 2nd Fleet

Headquarters: Norfolk
Mission: Commander, U.S. 2nd Fleet is responsible for U.S. Navy operations and defense of U.S. interests in the North Atlantic Ocean, and is also responsible for the training/certification of East Coast Carrier and Expeditionary Strike Groups.
AO: The North Atlantic Ocean
Flagship: Rotational

U.S. PACIFIC COMMAND (PACOM)

U.S. Pacific Fleet

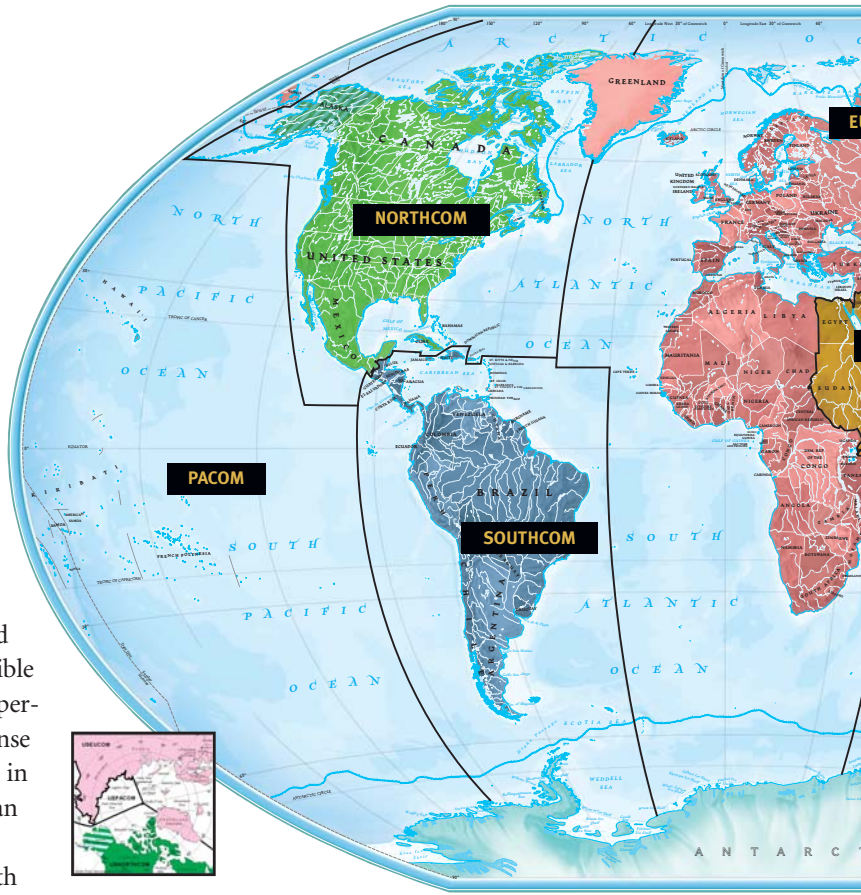
Headquarters: Pearl Harbor
Mission: U.S. Pacific Fleet (PACFLT), operates in support of the PACOM Theater Security Strategy, and provides interoperable, trained and combat-ready naval forces to Commander, PACOM and other U.S. combatant commanders, as required. In addition to these traditional Title X responsibilities, PACFLT has an increasing operational role as Commander, Joint Task Force 519. This mission requires PACFLT to not only maintain the training and readiness of the Joint Task Force headquarters staff, but also command the joint force during times of conflict, crisis or war. Joint Task Force 519 is a standing joint task force headquarters that trains throughout the year and is ready to deploy at any time. It gives the combatant commander, U.S. Pacific Command, a standing joint task force built around its service component command headquarters that can come together very quickly to deal with a peacetime contingency or wartime threat. Joint Task Force 519 has a core headquarters element, distributed manning, frequent training opportunities and interactions.

U.S. 3rd Fleet

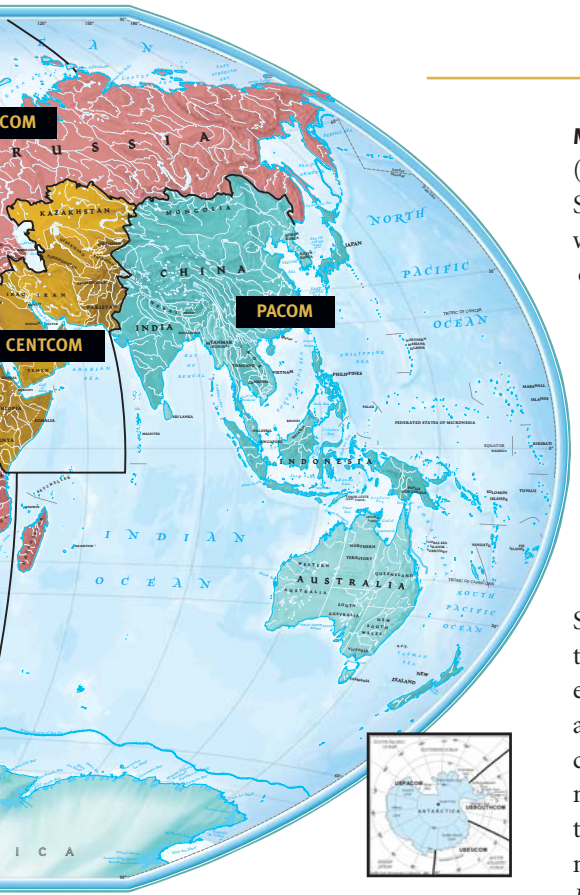
Headquarters: San Diego
Mission: U.S. 3rd Fleet is responsible for U.S. Navy operations and defense of U.S. interests in the Pacific Ocean from the North Pole to the South Pole and from the continental West Coast to the international date line. The U.S. 3rd Fleet is responsible for the training/certification of West Coast Carrier Strike Groups and Expeditionary Strike Groups.
AO: The Pacific Ocean from CONUS West Coast to the International Date Line.

U.S. 7th Fleet

Headquarters: Yokosuka, Japan
Mission: U.S. 7th Fleet's responsibility is to defend and protect the territory, citizens, commerce, sea lanes, allies and other vital interests of the United States; deter aggression with capable, flexible and mobile U.S. naval forces, cooperating closely with other U.S. military services and the forces of allied and friendly nations; if deterrence fails, conduct prompt and sustained combat operations to terminate hostilities on terms favorable to the United States and allies. Commander, U.S. 7th Fleet wears three hats: as operational commander for all naval forces in the region; as a Joint Task Force commander in the event of natural disaster or joint military operation; and as the Combined Naval Component Commander for the defense of the Korean



Maps courtesy of the National Geographic Society.



peninsula; in the event of hostilities, all friendly naval forces in the theater would fall under 7th Fleet control.
AO: Fifty-two million square miles of the Pacific and Indian Oceans, from the international date line to the waters east of Africa, and from the Kuril Islands in the north to the Antarctic in the south.
Flagship: USS *Blue Ridge* (LCC 19)

U.S. SOUTHERN COMMAND (SOUTHCOM)

U.S. Naval Forces Southern Command

Headquarters: Mayport, Fla.
Mission: Naval Forces Southern Command (NAVSO) is the naval component for Southern Command (SOUTHCOM), which is headquartered in Miami. NAVSO directs U.S. naval forces operating in the region and interacts with Caribbean, Central and South American civil forces and navies to shape the maritime environment within SOUTHCOM's AOR. With a focus on Theater Security Cooperation (TSC), NAVSO works to build and strengthen relations, develop partner nation capabilities and maintain maritime access to defend the United States. TSC encompasses a robust strategy that includes military-to-military exchanges, multi-national exercises and training, diplomatic port visits and community relations activities. NAVSO maintains a strong presence in the region through participation in a variety of maritime exercises including *UNITAS, PANAMAX, Teamwork South, Silent Forces* Exercises and others. Through annual meetings such as Operational Naval Committees, NAVSO fosters a continuous dialogue between regional partner nations. NAVSO also provides operational control for U.S. Navy units supporting joint and inter-agency efforts in counter-narcotics terrorism (CNT) operations, and efforts to stem the flow of illegal migration.
AO: Waters surrounding 32 countries and 12 dependencies, and covering about 15.6 million square miles. The region represents about one-sixth of the landmass of the world assigned to regional unified commands, and includes 410 million people.

U.S. CENTRAL COMMAND (CENTCOM)

U.S. Naval Forces Central Command/ U.S. 5th Fleet/Combined Forces Maritime Component Commander

Headquarters: Manama, Bahrain
Mission: U.S. and coalition forces operating in this region conduct maritime security operations (MSO). MSO help set the conditions for security and stability in the maritime environment. These operations deny international terrorists use of the maritime environment as a venue for attack or to transport personnel, weapons or other material. Coalition naval forces complement the counter-terrorism and security efforts of regional nations, and together work toward a common goal against a common enemy – an enemy of peace, an enemy of stability, an enemy of prosperity.
AO: Covering approximately 7.5 million square miles, the area of operations includes the Persian Gulf, Red Sea, Gulf of Oman and parts of the Indian Ocean. This expanse, comprised of 27 countries, includes three critical chokepoints at the Strait of Hormuz, the Suez Canal and the Strait of Bab al Mandeb at the southern tip of Yemen.

U.S. EUROPEAN COMMAND (EUCOM)

Commander, U.S. Naval Forces Europe-Commander, U.S. 6th Fleet

Headquarters: Naples, Italy.
Mission: U.S. Naval Forces Europe-Commander, U.S. 6th Fleet (CNE-C6F) is the maritime arm of EUCOM responsible for supporting National Military Strategy and the strategic objectives of EUCOM and the Chief of Naval Operations. CNE-C6F provides overall, command, operational control, and coordination of U.S. Naval forces in the EUCOM area of responsibility. Depending on regional necessity, 6th Fleet's force structure could consist of an aircraft carrier strike group, an expeditionary strike group with an embarked Marine Expeditionary Unit, and various support ships, land-based patrol aircraft and nuclear-powered attack submarines. Providing presence with a purpose, CNE-C6F follows a peacetime engagement plan centering on exercises and operations that improve interoperability and increase regional maritime security among European and African nations. U.S. naval forces in Europe and Africa remain committed to building emerging partnerships' maritime capacity and capability while positively shaping the environment "south and east" to deny maritime criminals, terrorists or any other destabilizing element freedom of action.
AO: More than 21 million square miles including 91 countries and territories. This territory extends from the Cape of Norway through the waters of the Baltic and Mediterranean Seas, most of Europe, parts of the Middle East to the Cape of Good Hope in South Africa.
Flagship: USS *Mount Whitney* (LCC/JCC 20)

Bases Worldwide

UNITED STATES

California
- Naval Air Weapons Station (NAWS) China Lake
- Naval Air Facility (NAF) El Centro
- Naval Air Station (NAS) Lemoore
- Naval Base (NB) Coronado
- NB Ventura County
- Naval Station (NAVSTA) San Diego
- Naval Support Activity (NSA) Monterey
- Naval Weapons Station (NWS) Seal Beach
- Naval Submarine Base (SUBASE) San Diego

Connecticut
- Naval SUBASE New London

District of Columbia
- Naval District Washington

Florida
- NAS Jacksonville
- NAS Key West
- NAS Whiting Field
- NAS Pensacola
- NAVSTA Mayport
- NSA Panama City
- Naval Air Weapons Center (NAWC) Orlando

Georgia
- NAS Atlanta
- NSA Athens
- Naval SUBASE Kings Bay

Hawaii
- Navy Region Hawaii, Pearl Harbor
- NAVSTA Pearl Harbor
- Pacific Missile Range Facility, Kekaha

Illinois
- NAVSTA Great Lakes

Indiana
- NSA Crane

Louisiana
- NAS Joint Reserve Base (JRB) New Orleans
- NSA New Orleans

Maine
- NAS Brunswick

Maryland
- NAS Patuxent River

Mississippi
- Naval Construction Battalion Center Gulfport
- NAS Meridian

Photo by Ethan C. Macnow

▲ Naval Subase New London, Conn.

Nevada
- NAS Fallon

New Hampshire
- NSA Portsmouth Shipyard

New Jersey
- Naval Air Engineering Station, Lakehurst
- NWS Earle

New York
- Naval Support Unit (NSU) Saratoga Springs

Pennsylvania
- NAS JRB Willow Grove
- NSA Mechanicsburg

Rhode Island
- NAVSTA Newport

South Carolina
- NWS Charleston

Tennessee
- NSA Mid-South, Millington

Texas
- NAS Corpus Christi
- NAS JRB Fort Worth
- NAS Kingsville
- NAVSTA Ingleside

Virginia
- Naval Amphibious Base (NAB) Little Creek
- NAS Oceana
- NAVSTA Norfolk
- NSA Norfolk
- NWS Yorktown
- NSA Norfolk Naval Shipyard

Washington
- NAS Whidbey Island
- NB Kitsap
- NAVSTA Everett
- Naval Magazine Indian Island

West Virginia
- Naval Security Group, Activity (NSGA) Sugar Grove

WORLDWIDE

Bahrain
- NSA Bahrain

Cuba
- NAVSTA Guantanamo Bay

Diego Garcia
- NSF Diego Garcia Indian Ocean

Greece
- NSA Souda Bay

Guam
- NB Guam

Italy
- NAS Sigonella
- NSA Gaeta
- NSA La Maddalena
- NSA Naples

Japan
- NAF Atsugi
- NAF Misawa
- Commander Fleet Activities (CFA) Yokosuka
- CFA Sasebo
- CFA Kadena Okinawa

Korea
- CFA Chinhae

Singapore
- Naval Regional Contracting Center, Singapore

Spain
- NAVSTA Rota

United Kingdom
- NAF Mildenhall
- NAVACT London
- Joint Military Facility (JMF) St. Mawgan

(Source: CNI)

▼ Naval Station Norfolk

Photo by MCSN Zachary Hernandez

Enlisted Ratings

AB
Aviation Boatswain's Mate
ABE – Equipment
ABF – Fuel
ABH – Handling

AC
Air Traffic Controller

AD
Aviation Machinist's Mate

AE
Aviation Electrician's Mate

AG
Aerographer's Mate

AM
Aviation Structural Mechanic
AME – Equipment

AO
Aviation Ordnanceman

AS
Aviation Support Equipment Technician

AT
Aviation Electronics Technician

AW
Aviation Warfare Systems Operator

AZ
Aviation Maintenance Administrationman

BM
Boatswain's Mate

BU
Builder

CE
Construction Electrician

CM
Construction Mechanic

CS
Culinary Specialist

CT
Cryptologic Technician
CTA – Administration
CTI – Interpretive
CTM – Maintenance
CTN - Networks
CTO – Communications
CTR – Collection
CTT – Technical

DC
Damage Controlman

EA
Engineering Aide

EM
Electrician's Mate

EN
Engineman

EO
Equipment Operator

EOD
Explosive Ordinance Disposal

ET
Electronics Technician

FC
Fire Controlman

FT
Fire Control Technician

GM
Gunner's Mate

GS
Gas Turbine System Technician
GSE – Electrical
GSM – Mechanical

HM
Hospital Corpsman

HT
Hull Maintenance Technician

IC
Interior Communications Electrician

IS
Intelligence Specialist

IT
Information Systems Technician

LN
Legalman

MA
Master-at-Arms

MC
Mass Communication Specialist

MM
Machinist's Mate

MN
Mineman

MR
Machinery Repairman

MT
Missile Technician

MU
Musician

NC
Navy Counselor

ND
Navy Diver

OS
Operations Specialist

PC
Postal Clerk

PR
Aircrew Survival Equipmentman

PS
Personnel Specialist

QM
Quartermaster

RP
Religious Program Specialist

SB
Special Warfare Boat Operator

SH
Ship's Serviceman

SK
Storekeeper

SO
Special Warfare Operator

ST
Sonar Technician
STG – Surface
STS – Submarine

SW
Steelworker

TM
Torpedoman's Mate

UT
Utilitiesman

YN
Yeoman

AN*
Airman

FN*
Fireman

SN*
Seaman

** General Apprenticeship*

Enlisted Sailors wear their job specialty in plain sight. Rating badges, worn on the left sleeve, consist of an eagle (called a crow); chevrons indicating the wearer's rate; and a specialty mark indicating rating. While some of these ratings have historical significance (such as the boatswain's mate), others show the evolution of naval technology in modern times, such as the GS (gas turbine system technician).

Warfare Pins/Badges


Astronaut


Naval Astronaut (NFO)


Naval Aviator


Naval Aviation Observer and Flight Meteorologist


Flight Surgeon


Flight Nurse


Naval Flight Officer (NFO)


Aviation Experimental Psychologist and Aviation Physiologist


Enlisted Aviation Warfare Specialist


Naval Aviation Supply Corps


Aircrew


Marine Combat Aircrew


Special Warfare (SEAL)


Special Operations


Special Warfare Combatant-Craft Crewman


Surface Warfare Officer


Enlisted Surface Warfare Specialist


Surface Warfare Nurse Corps


Surface Warfare Medical Corps


Surface Warfare Dental Corps


Surface Warfare Medical Service Corps


Surface Supply Corps


Submarine (officer)


Submarine (enlisted)


Submarine Medical


Submarine Engineering Duty


Submarine Supply Corps


Submarine Combat Patrol


SSBN Deterrent Patrol

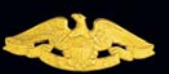

SSBN Deterrent Patrol (20 patrols)


Seabee Combat Warfare Specialist (officer)


Seabee Combat Warfare Specialist (enlisted)


Naval Parachutist


Basic Parachutist


Naval Reserve Merchant Marine


Enlisted Expeditionary Warfare Specialist

Source: NAVPERSCOM

Integrated Undersea Surveillance System (officer)

Integrated Undersea Surveillance System (enlisted)

Master Explosive Ordnance Disposal Warfare Specialist

Explosive Ordnance Disposal Warfare Specialist

Basic Explosive Ordnance Disposal Warfare Breast Insignia

Fleet Marine Force Officer

Fleet Marine Force (FMF) Enlisted Warfare Specialist

Diving (officer)

Diving Medical Officer

Master Diver

Diver (medical technician)

First Class Diver

Second Class Diver

Scuba Diver

Deep Submergence (enlisted)

Deep Submergence (officer)

Presidential Service Badge

Vice Presidential Service Badge

Office of the Secretary of Defense

Joint Chiefs of Staff

Recruiting Command for Excellence

Recruiter

Career Counselor

Division Commander for Excellence

Division Commander

Command-at-Sea

Command Ashore/ Project Manager

Small Craft (officer)

Small Craft (enlisted)

Craftmaster

Master Chief Petty Officer of the Navy

Fleet Master Chief Petty Officer

Force Master Chief Petty Officer

Command Master Chief Petty Officer

U.S. Navy Police (officer)

U.S. Navy Police (enlisted)

U.S. Navy Security

U.S. Navy Corrections

U.S. Navy Guard

U.S. Navy Master-at-Arms

Ships

CRUISERS

Modern U.S. Navy guided-missile cruisers perform primarily in a battle force role. These ships are multi-mission, anti-air warfare (AAW), anti-submarine warfare (ASW), long-range strike and anti-surface warfare (ASUW) surface combatants capable of supporting carrier and expeditionary strike groups (ESG), amphibious forces, or of operating independently and as flagships of surface action groups.

Ticonderoga-class

Power Plant: Four General Electric LM 2500 gas turbine engines; Two shafts, 80,000 shaft horsepower total.
Length: 567 feet
Beam: 55 feet
Displacement: 9,600 tons full load
Speed: 30 plus knots (34.5 plus mph)
Aircraft: Two SH-60 *Sea Hawk* (LAMPS III)
Crew: 364 (24 officers, 340 enlisted)
Armament: MK 26 missile launcher (CG 51); *Standard* Missile (MR) or MK-41 vertical launching system (CG 52 through CG 73); *Standard* Missile (MR); Vertical Launch ASROC (VLA) Missile; *Tomahawk* Cruise Missile; Six MK-46 torpedoes (from two triple mounts); Two MK-45 5-inch/54 caliber lightweight guns; Two *Phalanx* CIWS.

Ships:
USS *Bunker Hill* (CG 52)
USS *Mobile Bay* (CG 53)
USS *Antietam* (CG 54)
USS *Leyte Gulf* (CG 55)
USS *San Jacinto* (CG 56)
USS *Lake Champlain* (CG 57)
USS *Philippine Sea* (CG 58)
USS *Princeton* (CG 59)
USS *Normandy* (CG 60)
USS *Monterey* (CG 61)
USS *Chancellorsville* (CG 62)
USS *Cowpens* (CG 63)
USS *Gettysburg* (CG 64)
USS *Chosin* (CG 65)
USS *Hue City* (CG 66)
USS *Shiloh* (CG 67)
USS *Anzio* (CG 68)
USS *Vicksburg* (CG 69)
USS *Lake Erie* (CG 70)
USS *Cape St. George* (CG 71)
USS *Vella Gulf* (CG 72)
USS *Port Royal* (CG 73)

DESTROYERS

Guided-missile destroyers are multi-mission [anti-air warfare (AAW), anti-submarine warfare (ASW) and anti-surface warfare (ASUW)] surface combatants. They operate in support of carrier and expeditionary strike groups, surface action groups, amphibious groups and replenishment groups.

Photo by Paul Farley

▲ The guided-missile cruiser USS *Philippine Sea* (CG 58).

Arleigh Burke-class

Power Plant: Four General Electric LM 2500-30 gas turbines; two shafts, 100,000 total shaft horsepower, SPY-1 Radar and Combat System Integrator.
Length: Flights I and II (DDG 51-78): 505 feet; Flight IIA (DDG 79-98): 509 feet
Beam: 59 feet
Displacement: DDG 51 through 71: 8,315 tons full load; DDG 72 through 78: 8,400 tons full load; DDG 79 and on: 9,200 tons full load.
Speed: 30 plus knots (34.5 plus mph)
Aircraft: Hangar on later units. LAMPS III electronics installed on landing deck for coordinated DDG 51/helo ASW operations.
Crew: 323 (23 officers, 300 enlisted)
Armament: *Standard* missile; *Harpoon*; Vertical Launch ASROC (VLA) missiles; *Tomahawk*; Six MK-46 torpedoes (from two triple tube mounts); One 5-inch/54 caliber MK-45 lightweight gun; Two 20mm *Phalanx* CIWS.

Ships:
USS *Arleigh Burke* (DDG 51)
USS *Barry* (DDG 52)
USS *John Paul Jones* (DDG 53)
USS *Curtis Wilbur* (DDG 54)
USS *Stout* (DDG 55)
USS *John S. McCain* (DDG 56)
USS *Mitscher* (DDG 57)
USS *Laboon* (DDG 58)
USS *Russell* (DDG 59)
USS *Paul Hamilton* (DDG 60)
USS *Ramage* (DDG 61)
USS *Fitzgerald* (DDG 62)

USS *Stethem* (DDG 63)
USS *Carney* (DDG 64)
USS *Benfold* (DDG 65)
USS *Gonzalez* (DDG 66)
USS *Cole* (DDG 67)
USS *The Sullivans* (DDG 68)
USS *Milius* (DDG 69)
USS *Hopper* (DDG 70)
USS *Ross* (DDG 71)
USS *Mahan* (DDG 72)
USS *Decatur* (DDG 73)
USS *McFaul* (DDG 74)
USS *Donald Cook* (DDG 75)
USS *Higgins* (DDG 76)
USS *O'Kane* (DDG 77)
USS *Porter* (DDG 78)
USS *Oscar Austin* (DDG 79)
USS *Roosevelt* (DDG 80)
USS *Winston S. Churchill* (DDG 81)
USS *Lassen* (DDG 82)
USS *Howard* (DDG 83)
USS *Bulkeley* (DDG 84)
USS *McCampbell* (DDG 85)

Photo by Ensign Danny Ewing Jr.

▲ **USS Stethem (DDG 63)**

USS *Shoup* (DDG 86)
USS *Mason* (DDG 87)
USS *Preble* (DDG 88)
USS *Mustin* (DDG 89)
USS *Chafee* (DDG 90)
USS *Pinckney* (DDG 91)
USS *Momsen* (DDG 92)
USS *Chung-Hoon* (DDG 93)
USS *Nitze* (DDG 94)

▼ **USS *Hopper* (DDG 70)**

Photo by MC2 John L. Beeman

USS *James E.Williams* (DDG 95)
USS *Bainbridge* (DDG 96)
USS *Halsey* (DDG 97)
USS *Forrest Sherman* (DDG 98)
USS *Farragut* (DDG 99)
Kidd (DDG 100)*
Gridley (DDG 101)*
Sampson (DDG 102)*
Truxton (DDG 103)*
Sterett (DDG 104)*
Dewey (DDG 105)*
Stockdale (DDG 106)*
*Gravely (DDG 107)**
*Wayne E. Meyer (DDG 108)**

FRIGATES

Frigates fulfill a protection of shipping (POS) mission as anti-submarine warfare (ASW) combatants for amphibious expeditionary forces, underway replenishment groups and merchant convoys.

Oliver Hazard Perry-class

Power Plant: Two General Electric LM 2500 gas turbine engines; 1 shaft, 41,000 shaft horsepower total.
Length: 445 feet; 453 feet with LAMPS III modification.
Beam: 45 feet
Displacement: 4,100 tons full load
Speed: 29 plus knots (33.4 plus mph)
Aircraft: Two SH-60 (LAMPS III) in FFG 8, 28, 29, 32, 33, 36-61; One SH-2 (Lamps MK-I) in FFG 30, 31.
Crew: 215 (17 officers, 198 enlisted)
Armament: *Harpoon* (from *Standard* Missile Launcher); Six MK-46 torpedoes (from two triple mounts); One 3-inch/62 caliber MK-75 rapid fire gun; One *Phalanx* CIWS.

Ships:
USS *McInerney* (FFG 8)
USS *Boone* (FFG 28)**
USS *Stephen W. Groves* (FFG 29)**
USS *John L. Hall* (FFG 32)
USS *Jarrett* (FFG 33)
USS *Underwood* (FFG 36)**
USS *Crommelin* (FFG 37)**
USS *Curts* (FFG 38)**
USS *Doyle* (FFG 39)**
USS *Halyburton* (FFG 40)
USS *McClusky* (FFG 41)**
USS *Klakring* (FFG 42)**
USS *Thach* (FFG 43)
USS *DeWert* (FFG 45)
USS *Rentz* (FFG 46)
USS *Nicholas* (FFG 47)
USS *Vandegrift* (FFG 48)
USS *Robert G. Bradley* (FFG 49)
USS *Taylor* (FFG 50)
USS *Gary* (FFG 51)
USS *Carr* (FFG 52)
USS *Hawes* (FFG 53)
USS *Ford* (FFG 54)
USS *Elrod* (FFG 55)
USS *Simpson* (FFG 56)**

Photo by MCSN Lolita Lewis

▲ USS *Nicholas* (FFG 47)

USS *Reuben James* (FFG 57)
USS *Samuel B. Roberts* (FFG 58)
USS *Kauffman* (FFG 59)
USS *Rodney M. Davis* (FFG 60)**
USS *Ingraham* (FFG 61)

AMPHIBIOUS ASSAULT

Operating as part of the modern U.S. Navy, amphibious assault ships are called upon to perform as primary landing ships for assault operations of Marine expeditionary units. These ships use Air Cushion Landing Craft (LCAC), conventional landing craft and helicopters to move Marine assault forces ashore. In a secondary role, using AV-8B *Harrier* aircraft and antisubmarine warfare helicopters, these ships perform sea control and limited power projection missions.

Tarawa-class

Power Plant: Two boilers, two geared steam turbines, two shafts, 70,000 total shaft horsepower
Length: 820 feet
Beam: 106 feet
Displacement: 39,400 tons full load
Speed: 24 knots (27.6 mph)
Aircraft, depending on mission: 12 CH-46 *Sea Knight* helicopters; Four CH-53E *Sea Stallion* helicopters; Six AV-8B *Harrier* attack aircraft; Three UH-1N *Huey* helicopters; Four AH-1W *Super Cobra* helicopters.
Crew: 964 (82 officers, 882 enlisted)

Marine detachment: 1,900 plus
Armament: Two *RAM* launchers; Two *Phalanx* 20 mm CIWS mount; Three .50 cal. machine guns; Four 25 mm MK-38 machine guns.

Ships:
USS *Tarawa* (LHA 1)
USS *Saipan* (LHA 2)
USS *Nassau* (LHA 4)
USS *Peleliu* (LHA 5)

Wasp-class

Power Plant: Two boilers, two geared steam turbines, two shafts, 70,000 shaft horsepower; LHD 8-two gas turbines, 70,000 shaft horsepower, two auxiliary propulsion motors (5,000 hp each).
Length: 844 feet
Beam: 106 feet
Displacement: LHD 5 1-4: 40,650 tons full load; LHD 5 5-7: 40,358 tons full load; LHD 8: 41,772 tons full load.
Speed: 20 plus knots (23.5 plus mph).
Aircraft, depending on mission: 12 CH-46 *Sea Knight* helicopters; Four CH-53E *Sea Stallion* helicopters; Six AV-8B Harrier attack aircraft; Three UH-1N *Huey* helicopters; Four AH-1W *Super Cobra* helicopters.
Crew: 1,108 (104 officers, 1,004 enlisted).
Marine detachment: 1,894
Armament: Two RAM launchers; Two NATO *Sea Sparrow* launchers; Three 20mm *Phalanx* CIWS mounts (two on LHD 5-7); Four .50 cal. machine guns; Four 25mm MK 38 machine guns (LHD 5-7 have three 25mm MK-38 machine guns).

Photo by MC3 Dennard Vinson

▲ USS *San Antonio* (LPD 17)

Ships:
USS *Wasp* (LHD 1)
USS *Essex* (LHD 2)
USS *Kearsarge* (LHD 3)
USS *Boxer* (LHD 4)
USS *Bataan* (LHD 5)
USS *Bonhomme Richard* (LHD 6)
USS *Iwo Jima* (LHD 7)
Makin Island (LHD 8)*

AMPHIBIOUS TRANSPORT DOCK

Amphibious transports are used to transport and land Marines, their equipment and supplies by embarked air cushion or conventional landing craft or amphibious vehicles, augmented by helicopters or vertical take off and landing aircraft in amphibious assault, special operations, or expeditionary warfare missions.

Austin-class

Power plant: Two boilers, two steam turbines, two shafts, 24,000 shaft horsepower.
Length: 570 feet
Beam: 84 feet
Displacement: Approximately 17,000 tons (full load)
Speed: 21 knots (24.2 mph)
Aircraft: Up to six CH-46 *Sea Knight* helicopters
Crew: 420 (24 officers, 396 enlisted)
Marine detachment: 900
Armament: Two 25mm MK 38 guns; Two *Phalanx* CIWS; Eight .50-caliber machine guns.

Ships:
USS *Cleveland* (LPD 7)
USS *Dubuque* (LPD 8)
USS *Denver* (LPD 9)
USS *Juneau* (LPD 10)
USS *Nashville* (LPD 13)
USS *Ponce* (LPD 15)

* Under construction or authorized for construction
** Navy Reserve Force

San Antonio-class

Power Plant: Four sequentially turbocharged marine Colt-Pielstick diesels, two shafts, 41,600 shaft horsepower.
Length: 684 feet
Beam: 105 feet
Displacement: Approximately 24,900 tons (full load)
Speed: 22 plus knots (24.2 mph)
Aircraft: Launch or land two CH-53E *Super Stallion* helicopters or up to four CH-46 *Sea Knight* helicopters, MV-22 *Osprey* tilt rotor aircraft, AH-l or UI-I helicopters.
Armament: Two *Bushmaster* II 30mm Close in Guns, fore and aft; Two Rolling Airframe Missile launchers, fore and aft.
Landing Craft/Assault Vehicles: Two LCACs or one LCU; and 14 Advanced Amphibious Assault Vehicles.
Crew: 361 (28 officers, 333 enlisted)
Embarked Landing Force: 699 (66 officers, 633 enlisted); surge capacity to 800

Ships:
USS *San Antonio* (LPD 17)
New Orleans (LPD 18)*
Mesa Verde (LPD 19)*
Green Bay (LPD 20)*
New York (LPD 21)*
San Diego (LPD 22)*
Anchorage (LPD 23)*
Arlington (LPD 24)*
Somerset (LPD 25)*

▼ **USS *Ashland* (LSD 48)**

Photo by MCSN John Suits

AMPHIBIOUS DOCK LANDING

Dock Landing Ships support amphibious operations including landings via Air Cushion Landing Craft (LCAC), conventional landing craft and helicopters, onto hostile shores.

Whidbey Island-class

Power Plant: Four Colt Industries, 16 cylinder diesels, two shafts, 33,000 shaft horsepower.
Length: 609 feet
Beam: 84 feet
Displacement: 15,939 tons (full load)
Speed: 20 plus knots (23.5 plus mph)
Landing Craft: Four Air Cushion Landing Craft
Crew: 413 (22 officers, 391 enlisted)
Marine Detachment: 402 plus 102 surge
Armament: Two 25mm MK-38 Machine Guns; Two 20mm *Phalanx* CIWS mounts; Six .50 cal. machine guns.

Ships:
USS *Whidbey Island* (LSD 41)
USS *Germantown* (LSD 42)
USS *Fort McHenry* (LSD 43)
USS *Gunston Hall* (LSD 44)
USS *Comstock* (LSD 45)
USS *Tortuga* (LSD 46)
USS *Rushmore* (LSD 47)
USS *Ashland* (LSD 48)

Harpers Ferry-class

Power Plant: Four Colt Industries, 16 cylinder diesels, two shafts, 33,000 shaft horsepower.
Length: 609 feet
Beam: 84 feet
Displacement: 16,708 tons (full load)
Speed: 20 plus knots (23.5 plus mph)
Landing Craft: Two Air Cushion Landing Craft
Crew: 419 (22 officers, 397 enlisted)
Marine detachment: 402 plus 102 surge
Armament: Two 25mm MK-38 machine guns; Two 20mm Phalanx CIWS mounts; Six .50 cal. machine guns.

Ships:
USS *Harpers Ferry* (LSD 49)
USS *Carter Hall* (LSD 50)
USS *Oak Hill* (LSD 51)
USS *Pearl Harbor* (LSD 52)

AMPHIBIOUS COMMAND

Amphibious Command ships provide command and control for fleet commanders. Commissioned in 1970, these are the only ships to be designed initially for an amphibious command ship role. Earlier amphibious command ships lacked sufficient speed to keep up with a 20-knot amphibious force. USS *Blue Ridge* became the 7th Fleet command ship in 1979, and USS *Mount Whitney* became the 6th Fleet command ship in 2005. *Mount Whitney* was transferred to Military Sealift Fleet Services Command, but is still in commission.

Photo by OS2 Kevin D. Harris

▲ USS *Blue Ridge* (LCC 19)

Blue Ridge-class

Power Plant: Two boilers, one geared turbine, one shaft; 22,000 horsepower.
Length overall: 634 feet
Beam extreme: 108 feet
Displacement: 18,874 tons (full load)
Speed: 23 knots (26.5 mph)
Aircraft: All helicopters except the CH-53 Sea Stallion can be carried.
Crew: 842 (52 officers, 790 enlisted)

Ships:
USS *Blue Ridge* (LCC 19)
USS *Mount Whitney* (LCC/JCC 20)

* Under construction or authorized for construction

Photo by Gary Nichols

▲ USS *Scout* (MCM 8)

MINE WARFARE

Avenger-class ships are designed as mine hunter-killers capable of finding, classifying and destroying moored and bottom mines. The last three MCM ships were purchased in 1990, bringing the total to 14 fully deployable, oceangoing *Avenger*-class ships.

These ships use sonar and video systems, cable cutters and a mine detonating device that can be released and detonated by remote control. They are also capable of conventional sweeping measures. *Osprey* class (MHC 51) is also designed as mine hunter-killers. MHC 51 has a 15-day endurance and depends on a support ship, or shore-based facilities for re-supply.

Avenger-class

Power Plant: Four diesels (600 horsepower each), two shafts with controllable pitch propellers.
Length: 224 feet
Beam: 39 feet
Displacement: 1,312 tons (full load)
Speed: 14 knots
Crew: 84 (8 officers, 76 enlisted)
Armament: Mine neutralization system; Two .50 caliber machine guns.

Ships:
USS *Avenger* (MCM 1)**
USS *Defender* (MCM 2)**
USS *Sentry* (MCM 3)**
USS *Champion* (MCM 4)**
USS *Guardian* (MCM 5)
USS *Devastator* (MCM 6)
USS *Patriot* (MCM 7)
USS *Scout* (MCM 8)
USS *Pioneer* (MCM 9)
USS *Warrior* (MCM 10)
USS *Gladiator* (MCM 11)**
USS *Ardent* (MCM 12)
USS *Dextrous* (MCM 13)
USS *Chief* (MCM 14)

Osprey-class

Power Plant: Two diesels (800 hp each); two VoithSchneider (cycloidal) propulsion systems.
Length: 188 feet
Beam: 36 feet
Displacement: 893 ton(full load)
Speed: 10 knots
Crew: 51 (5 officers, 46 enlisted)
Armament: Two .50 caliber machine guns, nine neutralization systems and other mine countermeasures systems.

Ships:
USS *Kingfisher* (MHC 56)**
USS *Cormorant* (MHC 57)**
USS *Black Hawk* (MHC 58)**
USS *Shrike* (MHC 62)**

COASTAL PATROL SHIPS (PC)

The primary mission of these ships is coastal patrol and interdiction surveillance, an important aspect of littoral operations outlined in the Navy's Sea Power. The *Cyclone*-class PCs are particularly suited for the maritime homeland security mission and have been employed jointly with the U.S. Coast Guard to help protect our nation's coastline, ports and waterways from terrorist attack. These ships provide the U.S. Navy with a fast, reliable platform that can respond to emergent requirements in a shallow water environment.

The lead ship of the class, *Cyclone* (PC 1), was decommissioned and turned over to the U.S. Coast Guard in 2000 and five more were turned over to the Coast Guard in 2004.

Cyclone-class (Coastal Patrol)

Propulsion: Four Paxman diesels; Four shafts; 3,350 shaft horsepower.
Length: 170 feet

Photo by MC2 Justin K. Thomas

▲ USS *Whirlwind* (PC 11)

Beam: 25 feet
Displacement: 331 tons (full load)
Speed: 35 knots (40 mph)
Crew: 28 (Four officers, 24 enlisted)
Armament: One MK 96 and one MK 38 25mm machine guns; Five .50 caliber machine guns; Two MK 19, 40mm automatic grenade launchers; Two M-60 machine guns.

Ships:
USS *Hurricane* (PC 3)
USS *Typhoon* (PC 5)
USS *Sirocco* (PC 6)
USS *Squall* (PC 7)
USS *Chinook* (PC 9)
USS *Firebolt* (PC 10)
USS *Whirlwind* (PC 11)
USS *Thunderbolt* (PC 12)

LITTORAL COMBAT SHIP (LCS)

Littoral Combat Ship is a fast craft designed to operate in hostile near-shore environments. Two different designs are being built for Flight Zero, a monohull and a trimaran. Both have reconfigurable payloads for interchangeable mission packages that focus on anti-submarine, mine and surface warfare.

Lockheed Martin is building the first ship, *Freedom* (LCS 1), with delivery scheduled for FY07. General Dynamics is building *Independence* (LCS 2), with delivery scheduled for FY08.

Ships:
Freedom (LCS 1)*
Independence (LCS 2)*

SUBMARINE TENDERS

Submarine tenders furnish maintenance and logistic support for nuclear-powered attack submarines and are the largest of the active auxiliaries. Their crews are made up mostly of technicians and repair personnel.

Emory S. Land-class

Power Plant: Two boilers, geared turbines, one shaft, 20,000 shaft horsepower.
Length: 644 feet
Beam: 85 feet
Displacement: Approximately 23,493 tons (full load)
Speed: 20 knots (23 mph)
Aircraft: None
Crew: 1,363 (97 officers, 1,266 enlisted)
Armament: Two 40mm guns; Four 20mm guns.

Ships:
USS *Emory S. Land* (AS 39)
USS *Frank Cable* (AS 40)

OTHER SHIPS IN COMMISSION

USS *Constitution*
USS *Pueblo* (AGER 2)
Self Defense Test Ship (EDDG 31)

* Under construction or authorized for construction
** Navy Reserve Force
(*Source: OPNAV N8F*)

▼ *Freedom* (LCS 1)

Photo courtesy Lockheed Martin

MSC Ships

NAVAL FLEET AUXILIARY FORCE (NFAF)

Ammunition Ships T-AE
- USNS *Kilauea* (T-AE 26)
- USNS *Flint* (T-AE 32)
- USNS *Shasta* (T-AE 33)
- USNS *Mount Baker* (T-AE 34)
- USNS *Kiska* (T-AE 35)

Combat Stores Ships T-AFS
- USNS *Niagara Falls* (T-AFS 3)
- USNS *Concord* (T-AFS 5)
- USNS *San Jose* (T-AFS 7)
- USNS *Spica* (T-AFS 9)
- USNS *Saturn* (T-AFS 10)

Fast Combat Support Ships T-AOE
- USNS *Supply* (T-AOE 6)
- USNS *Rainer* (T-AOE 7)
- USNS *Arctic* (T-AOE 8)
- USNS *Bridge* (T-AOE 10)

Hospital Ships T-AH
- USNS *Mercy* (T-AH 19)
- USNS *Comfort* (T-AH 20)

Dry Cargo/Ammunition Ships T-AKE
- USNS *Lewis and Clark* (T-AKE 1)
- USNS *Sacagawea* (T-AKE 2)*
- USNS *Alan Shepard* (T-AKE 3)*

Fleet Replenishment Oilers T-AO
- USNS *Henry J. Kaiser* (T-AO 187)
- USNS *John Lenthall* (T-AO 189)
- USNS *Walter S. Diehl* (T-AO 193)
- USNS *John Ericsson* (T-AO 194)
- USNS *Leroy Grumman* (T-AO 195)
- USNS *Kanawha* (T-AO 196)
- USNS *Pecos* (T-AO 197)
- USNS *Big Horn* (T-AO 198)
- USNS *Tippecanoe* (T-AO 199)
- USNS *Guadalupe* (T-AO 200)
- USNS *Patuxent* (T-AO 201)
- USNS *Yukon* (T-AO 202)
- USNS *Laramie* (T-AO 203)
- USNS *Rappahannock* (T-AO 204)

Fleet Ocean Tugs T-ATF
- USNS *Catawba* (T-ATF 168)
- USNS *Navajo* (T-ATF 169)
- USNS *Sioux* (T-ATF 171)
- USNS *Apache* (T-ATF 172)

Rescue and Salvage Ships T-ARS
- USNS *Grasp* (ARS 51)
- USNS *Grapple* (ARS 53)
- USS *Safeguard* (T-ARS 50)*
- USS *Salvor* (ARS 52)*

SPECIAL MISSION SHIPS

Acoustic Survey Ship T-AG
- USNS *Hayes* (T-AG 195)

Cable Laying/Repair Ship T-ARC
- USNS *Zeus* (T-ARC 7)

Command Ship LCC
- USS *Mount Whitney* (LCC/JCC 20)

Photo by MCSN Scott C. Rancillo

▲ USNS *Lewis and Clark* (T-AKE 1)

Missile Range Instrumentation/Navigation Test Support Ships T-AGM
- USNS *Observation Island* (T-AGM 23)
- USNS *Invincible* (T-AGM 24)

Navigation Test Support Ships T-AGS
- USNS *Waters* (T-AGS 45)

Ocean Surveillance Ships T-AGOS
- USNS *Victorious* (T-AGOS 19)
- USNS *Effective* (T-AGOS 21)
- USNS *Loyal* (T-AGOS 22)
- USNS *Impeccable* (T-AGOS 23)
- MV *Cory Chouest*

Oceanographic Survey Ships T-AGS
- USNS *John McDonnell* (T-AGS 51)
- USNS *Pathfinder* (T-AGS 60)
- USNS *Sumner* (T-AGS 61)
- USNS *Bowditch* (T-AGS 62)
- USNS *Henson* (T-AGS 63)
- USNS *Bruce C. Heezen* (T-AGS 64)
- USNS *Mary Sears* (T-AGS 65)

Special Mission Chartered Ships
- SSV *C-Commando*
- MV *Dolores Chouest*
- MV *Kellie Chouest*
- MV *Caro1yn Chouest*

High Speed Vessels (HSV)
- HSV *Swift* (HSV 2)

PREPOSITIONING PROGRAM/MARITIME PREPOSITIONING PROGRAM

Container Ships T-AK
- MV *Capt. Steven L. Bennett* (T-AK 4296)
- MV *Maj. Bernard F. Fisher* (T-AK 4396)
- MV *A1C William A. Pitsenbarger* (T-AK 4638)
- MV *TSgt. John A. Chapman* (T-AK 323)
- MV LTC *John U.D. Page* (T-AK 4496)
- MV *SSG Edward A. Carter, Jr.* (T-AK 4544)

Maritime Prepositioning Ships T-AK

MV *Cpl. Louis J. Hauge, Jr.* (T-AK 3000)
MV *PFC William B. Baugh* (T-AK 3001)
MV *PFC James Anderson, Jr.* (T-AK 3002)
MV *1st Lt. Alex Bonnyman* (T-AK 3003)
MV *Pvt. Franklin J. Phillips* (T-AK 3004)
MV *Sgt. Matej Kocak* (T-AK 3005)
MV *PFC Eugene A. Obregon* (T-AK 3006)
MV *Maj. Stephen W. Pless* (T-AK 3007)
MV *2nd Lt. John P. Bobo* (T-AK 3008)
MV *PFC Dewayne T. Williams* (T-AK 3009)
MV *1st Lt. Baldomero Lopez* (T-AK 3010)
MV *1st Lt. Jack Lummus* (T-AK 3011)
MV *Sgt. William R. Button* (T-AK 3012)
USNS *1st Lt. Harry L. Martin* (T-AK 3015)
USNS *Gunnery Sgt. Fred W. Stockham* (T-AK 3017)
USNS *Lance Cpl. Roy M. Wheat* (T-AK 3016)

Transport Tankers T-AOT

SS *Chesapeake* (T-AOT 5084)
SS *Petersburg* (T-AOT 9101)

Aviation Logistics Ships T-AVB

SS *Wright* (T-AVB 3)
SS *Curtiss* (T-AVB 4)

Photo by Air Force Tech. Sgt. Denise A. Rayder

Large, Medium-speed Roll-on/ Roll-off Ships T-AKR

USNS *Watson* (T-AKR 310)
USNS *Sisler* (T-AKR 311)
USNS *Dahl* (T-AKR 312)
USNS *Red Cloud* (T-AKR 313)
USNS *Charlton* (T-AKR 314)
USNS *Watkins* (T-AKR 315)
USNS *Pomeroy* (T-AKR 316)
USNS *Soderman* (T-AKR 317)

High-Speed Vessel (HSV)

MV *WestPac Express* (HSV 4676)

Modular Cargo Distribution System T-AK

MV *Cape Jacob* (T-AK 5029)

SEALIFT FORCE

Fast Sealift Ships T-AKR

USNS *Algol* (T-AKR 287)
USNS *Bellatrix* (T-AKR 288)
USNS *Denebola* (T-AKR 289)
USNS *Pollux* (T-AKR 290)
USNS *Altair* (T-AKR 291)
USNS *Regulus* (T-AKR 292)
USNS *Capella* (T-AKR 293)
USNS *Antares* (T-AKR 294)

Large, Medium-speed Roll-on/ Roll-off Ships T-AKR

USNS *Gordon* (T-AKR 296)
USNS *Gilliland* (T-AKR 298)
USNS *Shughart* (T-AKR 295)
USNS *Yano* (T-AKR 297)
USNS *Bob Hope* (T-AKR 300)
USNS *Fisher* (T-AKR 301)
USNS *Seay* (T-AKR 302)

◀ **USNS *Pililaau* (T-AKR 304)**

Photo by MCSN Dale Patrick B. Frost

▲ **USNS *Supply* (T-AOE 6)**

USNS *Mendonca* (T-AKR 303)
USNS *Pililaau* (T-AKR 304)
USNS *Brittin* (T-AKR 305)
USNS *Benavidez* (T-AKR 306)

Transport Tankers T-AOT

USNS *Paul Buck* (T-AOT 1122)
USNS *Samuel L. Cobb* (T-AOT 1123)
USNS *Richard G. Matthiesen* (T-AOT 1124)
USNS *Lawrence H. Gianella* (T-AOT 1125)
MV *Montauk*

Long-term Chartered Container Ships

MV *Baffin Strait*

Ice-strengthened Container Ships

MV *American Tern*

Tug Barge

T/B *Sea Mark III*/MOBRO 1210

* To be delivered to MSC in 2007
(Source: Military Sealift Command)

COMMANDER NAVY EXPEDITIONARY COMBAT COMMAND LITTLE CREEK, VA.

In January 2006, the Navy established the Navy Expeditionary Combat Command (NECC) to train, man and equip the Navy's expeditionary forces and to provide the full spectrum of expeditionary capabilities to extend the joint operational force maritime component commander's tactical and operational reach near coastlines, inshore and in the riparian environment. NECC is a force multiplier that merged Explosive Ordnance Disposal (EOD), Expeditionary Logistics Support, Naval Coastal Warfare (NCW), Mobile Diving and Salvage, Seabees, Riverine Forces, the Maritime Civil Affairs Group (MCAG), Combat Camera Atlantic, the Expeditionary Combat Readiness Center (ECRC) and the Expeditionary Training Command (ETC) under one umbrella.

Photo by MC1(AW) Brien Aho

▲ Members of Riverine Squadron (RIVRON) 1 practice insertion and extraction drills in a Riverine Assault Craft (RAC) during the coxswain phase of riverine training aboard Marine Corps Base Camp Lejeune, N.C.

NAVAL COASTAL WARFARE

Naval Coastal Warfare provides worldwide maritime and in-shore surveillance, security and anti-terrorism force protection (ATFP) in bays and harbors, on airfields and piers, and onboard Navy vessels. NCW Squadrons man radar encampments and provide surveillance information to units guarding high-value assets. Mobile Security Forces provide ATFP onboard Navy vessels and for critical airfields and foreign assets.

NCW Group 1, San Diego
NCW Squadron 5, San Diego
NCW Squadron 30, San Diego
NCW Squadron 33, Seattle
NCW Squadron 34, San Pedro, Calif.
Mobile Security Squadron 3, San Diego
Mobile Security Squadron 7, Guam

NCW Group 2, Portsmouth, Va.
NCW Squadron 4, Portsmouth, Va.
NCW Squadron 21, Newport, R.I.
NCW Squadron 25, Yorktown, Va.
NCW Squadron 26, Jacksonville, Fla.
Mobile Security Squadron 6, Portsmouth, Va.
Mobile Security Squadron 2, Portsmouth, Va.

EXPLOSIVE ORDNANCE DISPOSAL

EOD conducts counter improvised explosive device (IED) operations, renders safe explosive hazards and disarms underwater explosives such as mines. EOD specialists can handle chemical, biological and radiological threats and are the only military EOD force that can both parachute from the air to reach distant targets or dive under the sea to disarm weapons. EOD's Mobile Diving and Salvage Units (MDSU) clear harbors of navigation hazards, engage in underwater search and recovery operations, and perform limited underwater repairs on ships.

EOD Group 1, San Diego
EOD Training and Evaluation Unit (TEU) 1, San Diego
Navy Special Clearance Team (NSCT) 1, San Diego
Mobile Dive Salvage Unit (MDSU) 1, Pearl Harbor
EOD Mobile Unit (EODMU) 3, San Diego

EODMU 5, Guam
EODMU 11, Whidbey Island
EOD Operational Support Unit 7, San Diego

EOD Group 2, Norfolk

EOD TEU 2, Virginia Beach, Va.
MDSU 2, Little Creek, Va.
EODMU 2, Little, Creek, Va.
EODMU 4, Bahrain
EODMU 6, Charleston, S.C.
EODMU 8, Sigonela, Italy
EOD Operational Support Unit 10, Virginia Beach, Va.

NAVY EXPEDITIONARY LOGISTICS GROUP WILLIAMSBURG, VA.

NAVELSG delivers worldwide expeditionary logistics with active and reserve personnel to conduct port and air cargo handling missions, customs inspections, contingency contracting capabilities, fuels distribution, freight terminal and warehouse operations, postal services and ordnance reporting and handling.

Naval Cargo Handling Battalions (NCHB)

NCHB 1, Williamsburg, Va.
NCHB 3, Alameda, Calif.
NCHB 4, Charleston, S.C.
NCHB 5, Tacoma, Wash.
NCHB 6, Orange, Texas
NCHB 7, Great Lakes, Ill.
NCHB 8, Fort Dix, N.J.
NCHB 9, Columbus, Ohio
NCHB 10, Norfolk
NCHB 11, Jacksonville, Fla.
NCHB 12, Bessemer, Ala.
NCHB 13, Gulfport, Miss.
NCHB 14, Port Hueneme, Calif

Navy Air Cargo Handling Battalion (NACHB), Williamsburg, Va.

Navy Supply Support Battalions (NSSB)

NSSB 1, Phoenix
NSSB 2, Quincy, Mass.

Navy Ordnance Reporting Handling Battalion (NORHB) Yorktown, Va.

Navy Expeditionary Logistics Response Center (NELRC) Williamsburg, Va.

NAVELSG Forward, Kuwait

Customs Detachment, Williamsburg, Va.

NAVAL CONSTRUCTION FORCE LITTLE CREEK, VA.

Naval Construction Force (Seabees) provide a wide range of construction in support of operating forces, including roads, bridges, bunkers, airfields and logistics bases; provide responsive support disaster recovery operations; perform civic action projects to improve relations with other nations; and provide anti-terrorism and force protection for personnel and construction projects. "We Build, We Fight."

1 Naval Construction Division

1 Naval Construction Division Forward, Hawaii

Naval Construction Regiments

1 NCR, Port Hueneme, Calif.
3 NCR, Atlanta
7 NCR, Newport, R.I.
9 NCR, Ft Worth, Texas
22 NCR, Gulfport, Miss.
30 NCR, Port Hueneme, Calif.

Seabee Readiness Groups

20th SRG, Gulfport, Miss.
31st SRG, Port Hueneme, Calif.

RIVERINE FORCE LITTLE CREEK, VA.

The Riverine Force establishes and maintains control of rivers and waterways for military and civil purposes, denies their use to hostile forces, and destroys waterborne hostile forces as necessary. The Riverine Force combats sea-based terrorism and other illegal activities, such as transporting components of weapons of mass destruction, hijacking, piracy and human trafficking.

Riverine Group 1, Little Creek, Va.

Riverine Squadron 1, Little Creek, Va.
Riverine Squadron 2, Little Creek, Va.

MARITIME CIVIL AFFAIRS GROUP LITTLE CREEK, VA.

Maritime Civil Affairs is an enabling force working directly with the civil authorities and civilian populations within a combatant commander's maritime area of operations to lessen the impact of military operations imposed during peace time, contingency operations and periods of declared war.

Maritime Civil Affairs Squadron 1, San Diego

Maritime Civil Affairs Squadron 2, Yorktown, Va.

EXPEDITIONARY TRAINING COMMAND LITTLE CREEK, VA.

ETC supports Combatant Commanders' Theater Security Cooperation (TSC) efforts by delivering timely, focused and customizable training to designated host nations. As needed, ETC draws training expertise from across the NECC force and DOD to assist in training delivery. Host nation training supports critical regional stability by helping improve the recipient nation's capabilities in exercising maritime sovereignty.

EXPEDITIONARY COMBAT READINESS CENTER LITTLE CREEK, VA.

ECRC coordinates and oversees all administrative processing, equipping, training, deployment and re-deployment of Sailors assigned as Individual Augmentees, in lieu of forces and to provisional units committed to Joint and Maritime Security Operations.

COMBAT CAMERA ATLANTIC NORFOLK

Navy Expeditionary Combat Command Det. Combat Camera Norfolk is a visual information acquisition unit, dedicated to providing rapid response aerial, surface and subsurface visual documentation of wartime operations in support of Combatant Commanders; Commander, U.S. Fleet Forces Command; Joint Chiefs of Staff; Office of the Secretary of Defense and President of the United States.

(Source: NECC)

Monthly Basic Pay Table

(effective Jan. 1, 2007)

Pay Grade	Years of Service: <2	2	3	4	6	8	10	12	14	16	18	20	22	24	26
Enlisted Members															
E-9*	0	0	0	0	0	0	4,110.60	4,203.90	4,321.20	4,459.50	4,598.40	4,821.60	5,010.30	5,209.20	5,512.80
E-8	0	0	0	0	0	3,364.80	3,513.90	3,606.00	3,716.40	3,835.80	4,051.80	4,161.30	4,347.30	4,450.50	4,704.90
E-7	2,339.10	2,553.00	2,650.80	2,780.70	2,881.50	3,055.20	3,152.70	3,326.70	3,471.00	3,569.70	3,674.40	3,715.50	3,852.00	3,925.20	4,204.20
E-6	2,023.20	2,226.00	2,324.40	2,419.80	2,519.40	2,744.10	2,831.40	3,000.00	3,051.90	3,089.70	3,133.50	3,133.50	3,133.50	3,133.50	3,133.50
E-5	1,854.00	1,977.90	2,073.30	2,171.40	2,323.80	2,483.70	2,613.90	2,630.10	2,630.10	2,630.10	2,630.10	2,630.10	2,630.10	2,630.10	2,630.10
E-4	1,699.50	1,786.50	1,883.10	1978.50	2,062.80	2,062.80	2,062.80	2,062.80	2,062.80	2,062.80	2,062.80	2,062.80	2,062.80	2,062.80	2,062.80
E-3	1,534.20	1,630.80	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20	1,729.20
E-2	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90	1,458.90
E-1	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40	1,301.40
E-1 with less than four months:			1,203.90												
Warrant Officers															
W-5	0	0	0	0	0	0	0	0	0	0	0	6,049.50	6,356.40	6,585.00	6,838.20
W-4	3,402.00	3,660.00	3,765.00	3,868.50	4,046.40	4,222.20	4,400.70	4,669.20	4,904.40	5,128.20	5,310.90	5,489.70	5,752.20	5,967.60	6,213.60
W-3	3,106.80	3,236.40	3,369.00	3,412.80	3,552.00	3,825.90	4,110.90	4,245.30	4,400.40	4,560.30	4,847.70	5,042.40	5,158.50	5,282.10	5,450.10
W-2	2,749.20	3,009.30	3,089.40	3,144.60	3,322.80	3,600.00	3,737.10	3,872.40	4,037.70	4,166.70	4,284.00	4,423.80	4,515.90	4,589.40	4,589.40
W-1	2,413.20	2,672.40	2,742.90	2,890.50	3,065.10	3,322.20	3,442.20	3,610.20	3,775.50	3,905.10	4,024.50	4,170.00	4,170.00	4,170.00	4,170.00
Commissioned Officers															
O-10	0	0	0	0	0	0	0	0	0	0	0	13,659.00	13,725.90	14,011.20	14,508.6
O-9	0	0	0	0	0	0	0	0	0	0	0	11,946.60	12,118.50	12,367.20	12,801.30
O-8	8,453.10	8,729.70	8,913.60	8,964.90	9,194.10	9,577.20	9,666.30	10,030.20	10,134.30	10,447.80	10,900.80	11,319.00	11,598.30	11,598.30	11,598.30
O-7	7,023.90	7,350.00	7,501.20	7,621.20	7,838.40	8,052.90	8,301.30	8,548.80	8,797.20	9,577.20	10,236.00	10,236.00	10,236.00	10,236.00	10,287.90
O-6	5,206.20	5,719.20	6,094.50	6,094.50	6,117.60	6,380.10	6,414.60	6,414.60	6,779.10	7,423.80	7,802.10	8,180.10	8,395.20	8,613.00	9,035.70
O-5	4,339.80	4,888.80	5,227.50	5,291.10	5,502.00	5,628.60	5,906.40	6,110.10	6,373.20	6,776.40	6,968.10	7,158.00	7,373.10	7,373.10	7,373.10
O-4	3,744.60	4,334.70	4,623.90	4,688.40	4,956.90	5,244.60	5,602.80	5,882.40	6,076.20	6,187.50	6,252.30	6,252.30	6,252.30	6,252.30	6,252.30
O-3	3,292.20	3,732.30	4,028.40	4,392.00	4,602.00	4,833.00	4,982.70	5,228.40	5,355.90	5,355.90	5,355.90	5,355.90	5,355.90	5,355.90	5,355.90
O-2	2,844.30	3,239.70	3,731.40	3,857.40	3,936.60	3,936.60	3,936.60	3,936.60	3,936.60	3,936.60	3,936.60	3,936.60	3,936.60	3,936.60	3,936.60
O-1	2,469.30	2,569.80	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50	3,106.50
Commissioned Officers (With more than 4 years of active service as an Enlisted Member or Warrant Officer)															
O-3E	0	0	0	4,392.00	4,602.00	4,833.00	4,982.70	5,228.40	5,435.40	5,554.20	5,715.90	5,715.90	5,715.90	5,715.90	5,715.90
O-2E	0	0	0	3,857.40	3,936.60	4,062.00	4,273.50	4,437.00	4,558.80	4,558.80	4,558.80	4,558.80	4,558.80	4,558.80	4,558.80
O-1E	0	0	0	3,106.50	3,317.70	3,440.10	3,565.50	3,688.80	3,857.40	3,857.40	3,857.40	3,857.40	3,857.40	3,857.40	3,857.40

*The rate of basic pay for an enlisted member serving in this grade as the Master Chief Petty Officer of the Navy is $6,642.60, regardless of cumulative years of service computed under Sect. 235, Title 37, U.S. Code.

Source: National Defense Authorization Act of 2007

Devices

GOLD STAR
Denotes subsequent awards of the same Navy decoration

SILVER STAR
Worn in lieu of five gold stars

BRONZE STAR
Represents participation in campaigns or operations, multiple qualification or an additional award to any of the various ribbons on which it is authorized. Also worn to denote first award of the single-mission Air Medal after Nov. 22, 1989.

SILVER SERVICE STAR
Worn in lieu of five bronze stars

BRONZE OAK LEAF CLUSTER
Represents second and subsequent entitlements of awards

SILVER OAK LEAF CLUSTER
Worn for the 6th, 11th, or in lieu of five bronze oak leaf clusters

WINTERED OVER
For wintering over on Antarctica continent – a clasp for Antarctica Service Medal; a suspension ribbon and a disc for the service ribbon; bronze for the first winter; gold for the second winter; and silver for the third

"V" DEVICE
Authorized for acts or service involving direct participation in combat operations

HOURGLASS
Issued for each succeeding award of the Armed Forces Reserve Medal

EUROPE AND ASIA CLASPS
Worn on the suspension ribbon of the Navy Occupation Service Medal

FLEET MARINE FORCE COMBAT OPERATIONS INSIGNIA
For Navy personnel attached to Fleet Marine Force units participating in combat operations

SILVER "E"
Denotes Expert Marksman qualification

BATTLE "E" DEVICE

BRONZE "S"
Denotes Sharpshooter Marksman qualification

"M" DEVICE
Denotes Naval Reserve mobilization in support of certain operations

STRIKE/FLIGHT DEVICE
Bronze Arabic numeral denotes the total number of strike/flight awards of the Air Medal earned subsequent to April 9, 1962

"3/16" PALM
Worn on the Republic of Vietnam Gallantry Cross Unit Citation and Republic of Vietnam Civil Actions Unit Citation ribbons

"E" DEVICE
Denotes four or more Battle "E" Awards

KUWAIT LIBERATION CLUSTER

REPUBLIC OF VIETNAM CAMPAIGN CLASP

U.S. Armed Forces Ranks

	Air Force	Army	Marine Corps	Navy & Coast Guard
E-9	 Chief Master Sergeant of the Air Force	 Sergeant Major of the Army	 Sergeant Major of the Marine Corps	 Master Chief Petty Officer of the Navy / Coast Guard
	 Chief Master Sergeant, First Sergeant, Command Chief Master Sergeant	 Sergeant Major, Command Sergeant Major	 Sergeant Major, Master Gunnery Sergeant	 Master Chief Petty Officer, Fleet/Force/Command Master Chief Petty Officer
E-8	 Senior Master Sergeant, First Sergeant	 Master Sergeant, First Sergeant	 First Sergeant, Master Sergeant	 Senior Chief Petty Officer
E-7	 Master Sergeant, First Sergeant	 Sergeant First Class	 Gunnery Sergeant	 Chief Petty Officer
E-6	 Technical Sergeant	 Staff Sergeant	 Staff Sergeant	 Petty Officer First Class
E-5	 Staff Sergeant	 Sergeant	 Sergeant	 Petty Officer Second Class
E-4	 Senior Airman	 Corporal, Specialist	 Corporal	 Petty Officer Third Class
E-3	 Airman First Class	 Private First Class	 Lance Corporal	 Seaman
E-2	 Airman	 Private	 Private First Class	 Seaman Apprentice

	Air Force	Army	Navy	Coast Guard
E-1	Airman Basic	Private	Private	Seaman Recruit

Officers

Devices shown are the same for all services.

	Air Force • Army • Marines Officer Ranks	Navy • Coast Guard Officer Ranks
O-10	General of the Air Force / Army *(Reserved for Wartime)* General	Fleet Admiral *(Reserved for Wartime)* Admiral / Commandant of the Coast Guard
O-9	Lieutenant General	Vice Admiral
O-8	Major General	Rear Admiral
O-7	Brigadier General	Rear Admiral *(Lower Half)*
O-6	Colonel	Captain
O-5	Lieutenant Colonel	Commander
O-4	Major	Lieutenant Commander
O-3	Captain	Lieutenant
O-2	First Lieutenant	Lieutenant Junior Grade
O-1	Second Lieutenant	Ensign

Warrant Officers

	Air Force	Army	Marine Corps	Navy & Coast Guard
	No Warrant	Warrant Officer 1	Warrant Officer 1	Warrant Officer 1 (Coast Guard only)
		Chief Warrant Officer 2	Chief Warrant Officer 2	Chief Warrant Officer 2
		Chief Warrant Officer 3	Chief Warrant Officer 3	Chief Warrant Officer 3
		Chief Warrant Officer 4	Chief Warrant Officer 4	Chief Warrant Officer 4
		Chief Warrant Officer 5	Chief Warrant Officer 5	Chief Warrant Officer 5

Order of Precedence

The following display represents the correct order of precedence for medals and/or ribbons most likely to be worn today on the Navy uniform. Additional information on the proper display, placement or additional devices is found in SECNAVINST 1650.1G and the U.S. Navy Uniform Regulations (NAVPERS 15565I).


Medal of Honor


Navy Cross


Defense Distinguished Service Medal


Distinguished Service Medal


Silver Star


Defense Superior Service Medal


Legion of Merit


Distinguished Flying Cross


Navy/Marine Corps Medal


Bronze Star

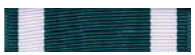

Purple Heart


Defense Meritorious Service Medal


Meritorious Service Medal


Air Medal


Joint Service Commendation Medal


Navy/Marine Corps Commendation Medal


Joint Service Achievement Medal


Navy/Marine Corps Achievement Medal

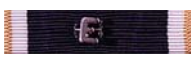

Combat Action Ribbon


Presidential Unit Citation


Joint Meritorious Unit Award


Navy Unit Commendation


Meritorious Unit Commendation


Navy "E" Ribbon


POW Medal


Good Conduct Medal


Navy Reserve Meritorious Service Medal


Navy Fleet Marine Force Ribbon


Navy Expeditionary Medal


National Defense Service Medal


Korean Service Medal


Antarctica Service Medal


Armed Forces Expeditionary Medal


Vietnam Service Medal


Southwest Asia Service Medal


Kosovo Campaign Medal


Afghanistan Campaign Medal


Iraq Campaign Medal


Global War on Terrorism Expeditionary Medal


Global War on Terrorism Service Medal

Korea Defense Service Medal

Armed Forces Service Medal

Humanitarian Service Medal

Military Outstanding Volunteer Service Medal

Sea Service Deployment Ribbon

Navy Arctic Service Ribbon

Navy Reserve Sea Service Ribbon

Navy/Marine Corps Overseas Service Ribbon

Navy Recruiting Service Ribbon

Navy Recruit Training Service Medal

Armed Forces Reserve Medal

Navy Reserve Medal

Philippine Presidential Unit Citation

Republic of Korea Presidential Unit Citation

Republic of Vietnam Presidential Unit Citation

Republic of Vietnam Gallantry Cross Unit Citation

Republic of Vietnam Civil Actions Unit Citation

United Nations Service Medal

United Nations Medal

NATO Medals

Multinational Force and Observers Medal

Inter American Defense Board Medal

Republic of Vietnam Campaign Medal

Kuwait Liberation Medal (Kingdom of Saudi Arabia)

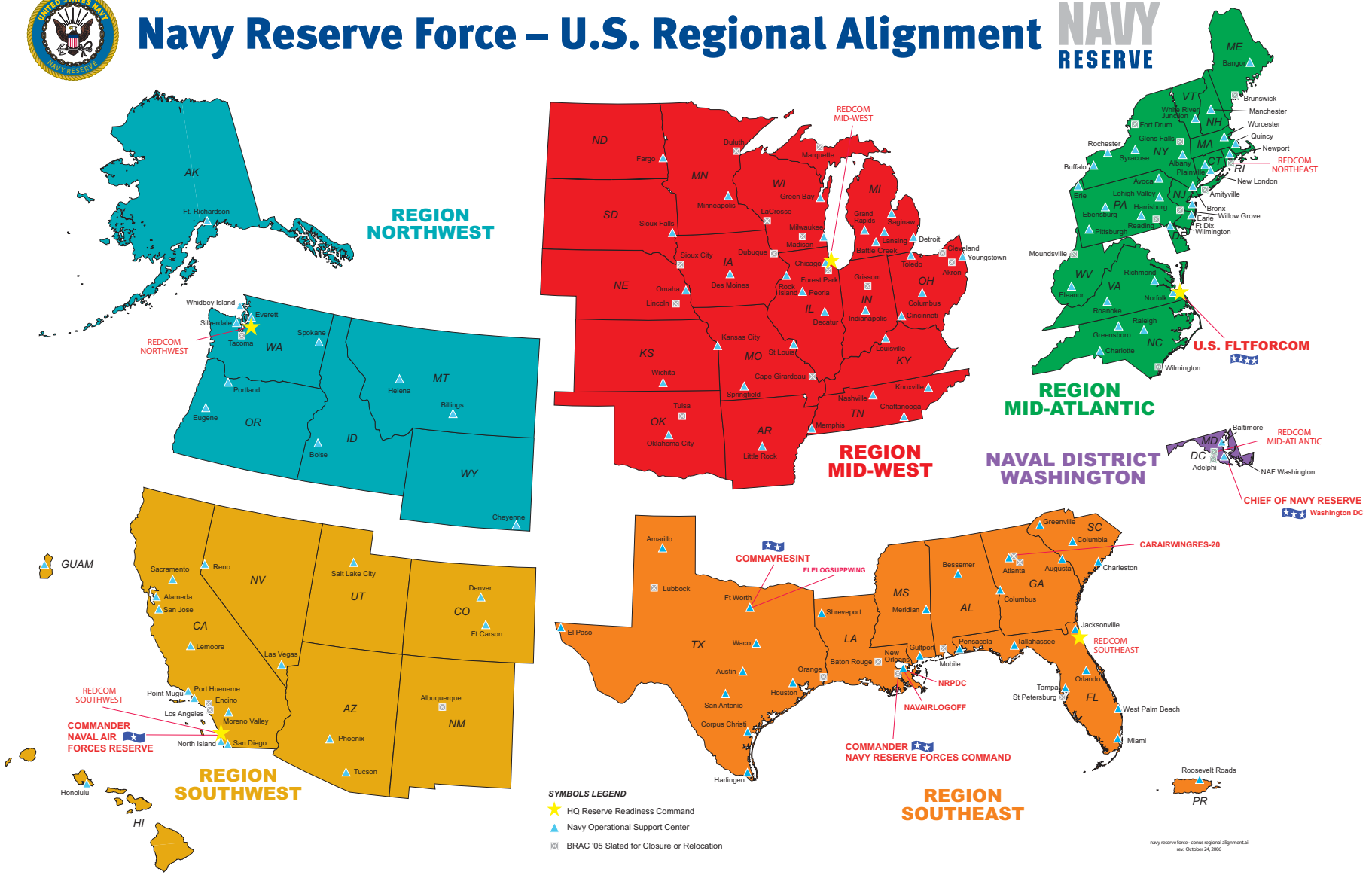
Kuwait Liberation (Kuwait)

Rifle Marksmanship Medal

Pistol Marksmanship Medal

Navy Reserve Force – U.S. Regional Alignment

NAVY RESERVE



ATTACK SUBMARINES

Attack submarines are designed to seek and destroy enemy submarines and surface ships. A number of Third World countries are acquiring modern, state-of-the-art, non-nuclear submarines. Countering this threat is the primary mission of U.S. nuclear-powered attack submarines. Other missions range from intelligence collection and special forces delivery to anti-ship and strike warfare. The *Seawolf*-class submarine is designed to be exceptionally quiet, fast and well-armed, with advanced sensors. It is a multi-mission vessel, capable of deploying to forward ocean areas to search out and destroy enemy submarines and surface ships and to fire missiles in support of other forces.

Los Angeles-class

Power Plant: One nuclear reactor, one shaft
Length: 360 feet
Beam: 33 feet
Displacement: Approx. 6,900 tons submerged
Speed: 20 plus knots (23 plus mph)
Crew: 134 (13 officers, 121 enlisted)
Armament: *Tomahawk* missiles; VLS tubes (SSN 719 and later), MK-48 torpedoes; Four torpedo tubes.

Photo by Paul Farley

▲ USS *Dallas* (SSN 700)

Ships:
USS *Los Angeles* (SSN 688)
USS *Philadelphia*(SSN 690)
USS *Memphis* (SSN 691)
USS *Bremerton* (SSN 698)
USS *Jacksonville* (SSN 699)
USS *Dallas* (SSN 700)
USS *La Jolla* (SSN 701)
USS *City of Corpus Christi* (SSN 705)
USS *Albuquerque* (SSN 706)
USS *Minneapolis-St.Paul* (SSN 708)
USS *Hyman G. Rickover* (SSN 709)
USS *Augusta* (SSN 710)
USS *San Francisco* (SSN 711)
USS *Houston* (SSN 713)
USS *Norfolk* (SSN 714)
USS *Buffalo* (SSN 715)
USS *Olympia* (SSN 717)
USS *Providence* (SSN 719)
USS *Pittsburgh* (SSN 720)
USS *Chicago* (SSN 721)
USS *Key West* (SSN 722)
USS *Oklahoma City* (SSN 723)
USS *Louisville* (SSN 724)
USS *Helena* (SSN 725)
USS *Newport News* (SSN 750)
USS *San Juan* (SSN 751)
USS *Pasadena* (SSN 752)
USS *Albany* (SSN 753)
USS *Topeka* (SSN 754)
USS *Miami* (SSN 755)
USS *Scranton* (SSN 756)
USS *Alexandria* (SSN 757)

USS *Asheville* (SSN 758)
USS *Jefferson City* (SSN 759)
USS *Annapolis* (SSN 760)
USS *Springfield* (SSN 761)
USS *Co1umbus* (SSN 762)
USS *Santa Fe* (SSN 763)
USS *Boise* (SSN 764)
USS *Montpelier* (SSN 765)
USS *Charlotte* (SSN 766)
USS *Hampton* (SSN 767)
USS *Hartford* (SSN 768)
USS *Toledo* (SSN 769)
USS *Tucson* (SSN 770)
USS *Columbia* (SSN 771)
USS *Greeneville* (SSN 772)
USS *Cheyenne* (SSN 773)

Seawolf-class

Power Plant: One nuclear reactor, one shaft
Length: 353 feet
Draft: 35 feet
Beam: 40 feet
Displacement: 8,060 tons surfaced; 9,150 tons submerged
Speed: 25 plus knots (28 plus mph)
Crew: 134 (13 officers; 121 enlisted)
Ships:
USS *Seawolf* (SSN 21)
USS *Connecticut* (SSN 22)
USS *Jimmy Carter* (SSN 23)

Virginia-class

Power Plant: One nuclear reactor, one shaft
Length: 377 feet
Beam: 34 feet
Displacement: Approx. 7,800 tons
Speed: 25 plus knots (28 plus mph)
Crew: 134 officers and enlisted
Armament: *Tomahawk* missiles; VLS tubes, MK-48 torpedoes; Four torpedo tubes; Advanced mobile mines, and unmanned undersea vehicles.
Ships:
USS *Virginia* (SSN 774)
USS *Texas* (SSN 775)
Hawaii (SSN 776)*
North Carolina (SSN 777)*
New Hampshire (SSN 778)*
New Mexico (SSN 779)*

BALLISTIC MISSILE/GUIDED MISSILE SUBMARINES

Strategic deterrence has been the sole mission of the fleet ballistic missile submarine (SSBN) since its inception in 1960. The SSBN provides the nation's most survivable and enduring nuclear strike capability. The *Ohio*-class submarine replaced aging fleet ballistic missile submarines built in the 1960s and is far more capable.

Ohio-class/*Trident* ballistic missile submarines provide the sea-based "leg" of the triad of U.S. strategic deterrent forces. The first four *Ohio*-class submarines are converting to guided missile submarines (SSGN) with an additional capability to transport and support Navy special operations forces.

Ohio-class

Power Plant: One nuclear reactor, one shaft
Length: 560 feet
Beam: 42 feet
Displacement: 16,764 tons surfaced; 18,750 tons submerged
Speed: 20 plus knots (23 plus mph)
Crew: 155 (15 Officers, 140 Enlisted)
Armament: 24 tubes for *Trident II*, D-5 Intercontinental Ballistic Missiles, MK-48 torpedoes, four torpedo tubes.
Ships:
USS *Henry M. Jackson* (SSBN 730)
USS *Alabama* (SSBN 731)
USS *Alaska* (SSBN 732)
USS *Nevada* (SSBN 733)
USS *Tennessee* (SSBN 734)
USS *Pennsylvania* (SSBN 735)
USS *West Virginia* (SSBN 736)
USS *Kentucky* (SSBN 737)
USS *Maryland* (SSBN 738)
USS *Nebraska* (SSBN 739)
USS *Rhode Island* (SSBN 740)
USS *Maine* (SSBN 741)
USS *Wyoming* (SSBN 742)
USS *Louisiana* (SSBN 743)

Ships Converted to SSGN:

USS *Ohio* (SSGN 726)
USS *Michigan* (SSGN 727)
USS *Florida* (SSGN 728)
USS *Georgia* (SSGN 729)**

Photo by MCC Dave Fliesen

▲ USS *Florida* (SSGN 728)

DEEP SUBMERGENCE RESCUE VEHICLES

Deep Submergence Rescue Vehicles (DSRV) perform rescue operations on submerged, disabled submarines of the U.S. Navy or foreign navies. DSRVs can embark up to 24 personnel for transfer to another vessel. The DSRV also has an arm to clear hatches on a disabled submarine and a combined gripper and cable cutter. The gripper is able to lift 1,000 pounds.

Power Plant: Electric motors, silver/zinc batteries, one shaft, 15 shaft horsepower, four thrusters, 7.5 horsepower.
Length: 49 feet
Beam: 8 feet
Displacement: 38 tons

* Under construction or authorized for construction
** Undergoing conversion

Speed: 4 knots
Maximum Depth: 5,000 feet
Sonar: Search and navigation
Crew: Two pilots, two rescue personnel and the capacity for 24 passengers.
Ships:
DSRV *Mystic*
DSRV *Avalon*

DEEP SUBMERGENCE CRAFT

NR 1, a nuclear–powered ocean engineering and research submarine, is the first deep submergence vessel using nuclear power. NR l's missions have included search, object recovery, geological survey, oceanographic research, and installation and maintenance of underwater equipment. NR 1 is generally towed to and from remote mission locations by an accompanying surface tender, which is also capable of conducting research in conjunction with the submarine.

Power Plant: One nuclear reactor, one turbo-alternator; Two external motors, two propellers, four ducted thrusters (two horizontal, two vertical).
Length: 150 feet
Displacement: 400 tons
Diameter: 12 feet
Maximum Operating Depth: 2,375 feet
Crew: 7 (2 officer, 3 enlisted, 2 scientists)
Armament: None
Ships:
NR-l (Nuclear)

LARGE SCALE VEHICLE 2 (LSV 2)

LSV 2 *Cutthroat*, the world's largest unmanned autonomous submarine, offers the capability to conduct a wide variety of studies dramatically improving the acoustic and operational performance of future submarines. *Cutthroat*, a 205-ton, large scale submarine test vehicle, is used to affordably explore and test emerging technologies and to conduct physics—based experiments. Specific emphasis will be on stealth, hydrodynamics, hydro-acoustics and propulsion designs to permit technology insertion into current and future submarines.

General Characteristics

Propulsion: Electric drive (3,000 shaft horsepower (shp) plant coupled with electric motor controller, expandable to 6,000 shp with additional motor controlled modules).
Length: 111 feet
Diameter: 10 feet
Weight: 205 tons
Armament: None
Crew: None
Ships:
Cutthroat (LSV 2)

(Source: OPNAV N8F)

Photo by MCC Todd P. Cichonowicz

▶ USS *Asheville* (SSN 758)

Aircraft Carriers

The aircraft carrier continues to be the centerpiece of the forces necessary for forward presence. Whenever there has been a crisis, the first question has been: "Where are the carriers?" Carriers support and operate aircraft that engage in attacks on airborne, afloat, and ashore targets that threaten free use of the sea; and engage in sustained operations in support of other forces.

Aircraft carriers are deployed worldwide in support of U.S. interests and commitments. They can respond to global crises in ways ranging from peacetime presence to full-scale war. Together with their on-board air wings, the carriers have vital roles across the full spectrum of conflict.

Nimitz-class

Length, overall: 1,092 feet
Flight Deck Width: 252 feet
Beam: 134 feet
Displacement: Approx. 97,000 tons
Aircraft: 70
Speed: 30 plus knots (34.5 plus mph)
Crew: 3,200; Air Wing: 2,480
Armament: Two or three (depending on modification) NATO *Sea Sparrow* launchers, 20mm *Phalanx CIWS* mounts: (three on *Nimitz* and *Dwight D. Eisenhower* and four on *Carl Vinson* and later ships of the class).
Carriers
USS *Nimitz* (CVN 68)
USS *Dwight D. Eisenhower* (CVN 69)
USS *Carl Vinson* (CVN 70)
USS *Theodore Roosevelt* (CVN 71)
USS *Abraham Lincoln* (CVN 72)
USS *George Washington* (CVN 73)
USS *John C. Stennis* (CVN 74)
USS *Harry S. Truman* (CVN 75)
USS *Ronald Reagan* (CVN 76)
PCU *George H.W. Bush* (CVN 77)*

John F. Kennedy-class

Length, overall: 1052 feet
Flight Deck Width: 252 feet
Beam: 130 feet
Displacement: 82,000 tons
Speed: 30 plus knots (34.5 mph)
Aircraft: 70
Crew: 3,117; Air Wing: 2,480
Armament: *Sea Sparrow* missiles with box launchers; Three 20mm *Phalanx* CIWS mounts.
Carriers
USS *John F. Kennedy* (CV 67)

Enterprise-class

Length, overall: 1,101 feet 2 inches
Flight Deck Width: 252 feet
Beam: 133 feet
Displacement: 89,600 tons
Speed: 30+ knots (34.5 mph)
Aircraft: 70
Crew: 3,350, Air Wing: 2,480
Armament: Two *Sea Sparrow* missile launchers; Three 20mm *Phalanx* CIWS mounts.
Carriers
USS *Enterprise* (CVN 65)

Kitty Hawk-class

Length, overall: 1062.5 feet
Flight Deck Width: 252 feet
Beam: 130 feet
Displacement: Approx. 80,800 tons
Speed: 30+ knots (34.5+ mph)
Aircraft: 70
Crew: 3,150, Air Wing: 2,480
Armament: *Sea Sparrow* launchers; Three 20mm *Phalanx* CIWS mounts.
Carriers
USS *Kitty Hawk* (CV 63)

* Under construction or authorized for construction
(Source: OPNAV N-8F)

▼ **USS Dwight D. Eisenhower (CVN 69)**

Photo by MCSN Patrick W. Mullen III

CARRIER BASED

F/A-18E/F *Super Hornet*

The F/A-18E/F provides the carrier strike group with a strike fighter that has significant growth potential and increased range, endurance and ordnance-carrying capabilities.

Wingspan: 44 ft., 8.5 in.
Length: 60 ft., 1.25 in.
Height: 16 ft.
Weight: 66,000 lbs. maximum takeoff
Speed: Mach 1.8 plus
Ceiling: 50,000 ft.
Range: 462 nm
Armament: 20mm MK-61 *Vulcan* cannon; *Sidewinder*, *Sparrow* and *AMRAAM* air-to-air missiles; *Maverick*, *Harpoon*, *HARM*, *SLAM-ER* and Joint Direct Attack Munition (JDAM); and other bombs and rockets.
Crew: 1(E)or 2(F), depending on model

SQUADRONS

VFA-2 Bounty Hunters
VFA-11 Red Rippers
VFA-14 Tophatters
VFA-22 Fighting Redcocks
VFA-27 Royal Maces
VFA-31 Tomcatters
VFA-32 Swordsmen
VFA-41 Black Aces
VFA-102 Diamondbacks
VFA-103 Jolly Rogers
VFA-105 Gunslingers
VFA-115 Eagles
VFA-122 Flying Eagles
VFA-137 Kestrels
VFA-143 Puking Dogs
VFA-154 Black Knights
VFA-211 Fighting Checkmates
VFA-213 Black Lions

Photo by MC2 Milosz Reterski

▲ F/A-18E/F *Super Hornets*

Photo by MC3 Jonathan Chandler

▲ F/A-18 *Hornet*

F/A-18 *Hornet*

The F/A-18 is an all-weather, attack aircraft that can also be used as a fighter. In its fighter mode, the F/A-18 is used primarily as an escort and for fleet air defense. In its attack mode, it is used for force projection, interdiction and close-air support.

Wingspan: 37.5 ft.
Length: 56 ft.
Height: 15 ft., 3.5 in.
Speed: Mach 1.8 plus
Range: 290 nm
Armament: 20mm MK-61 cannon; *Sidewinder*, *Sparrow* and *AMRAAM* air-to-air missiles; *Maverick*, *Harpoon*, *HARM*, *SLAM-ER*, Joint Direct Attack Munitions (JDAM); laser-guided and general purpose bombs and rockets.
Crew: 1(A,C) or 2(B,D), depending on model

SQUADRONS

Blue Angels
VFA-15 Valions
VFA-25 Fist of the Fleet
VFA-34 Blue Blasters
VFA-37 Bulls
VFA-81 Sunliners
VFA-83 Rampagers
VFA-86 Sidewinders
VFA-87 Golden Warriors
VFA-94 Mighty Shrikes
VFA-97 Warhawks
VFA-106 Gladiators
VFA-113 Stingers

Photo by MCCS Mahlon K. Miller

▲ EA-6B *Prowler*

VFA-125 Rough Raiders
VFA-131 Wildcats
VFA-136 Knighthawks
VFA-146 Blue Diamonds
VFA-147 Argonauts
VFA-151 Fighting Vigilantes
VFA-192 Golden Dragons
VFA-195 Dambusters
VFA-201(USNR) Hunters
VFA-204(USNR) River Rattlers
VFC-12(USNR) Fighting Omars

EA-6B *Prowler*

The EA-6B, a twin-engine, mid-wing aircraft designed for carrier and advanced base operations, is used to provide an umbrella of protection for strike aircraft by jamming enemy radar, electronic data links and communications. The EA-6B is a fully integrated electronic warfare system, combining long-range, all-weather capabilities with advanced electronic countermeasures.

Wingspan: 53 ft.
Length: 59 ft., 10 in.
Height: 16 ft., 3 in.
Weight: 65,000 lbs. maximum takeoff
Speed: 622 mph
Ceiling: 41,200 ft.
Range: 955 nm
Armament: *HARM*
Crew: 4 (1 pilot, 3 electronic warfare officers)

SQUADRONS

VAQ-129 Vikings
VAQ-130 Zappers
VAQ-131 Lancers
VAQ-132 Scorpions
VAQ-133 Wizards
VAQ-134 Garudas
VAQ-135 Black Ravens
VAQ-136 Gauntlets
VAQ-137 Rooks
VAQ-138 Yellowjackets
VAQ-139 Cougars
VAQ-140 Patriots
VAQ-141 Shadowhawks
VAQ-142 Gray Wolves
VAQ-209(USNR) Star Warriors

S-3B *Viking*

The S-3B, a jet aircraft used for anti-submarine and anti-surface warfare, is extremely versatile and can be equipped for tanking, mining and limited electronic surveillance.

Wingspan: 68 ft., 8 in.
Length: 53 ft., 4 in.
Height: 22 ft., 9 in.
Weight: 52,539 lbs. maximum design gross weight
Speed: 518 mph
Ceiling: more than 35,000 ft.
Range: more than 2,000 nm (combat)
Armament: torpedoes, bombs, *Harpoon* and *Maverick*.
Crew: 4 (1 pilot, 2 flight officers and 1 sensor operator)

SQUADRONS

VS-22 Checkmates
VS-24 Scouts
VS-29 Dragonfires
VS-31 Top Cats
VS-32 Maulers
VS-33 Screwbirds
VS-35 Blue Wolves
VS-38 Red Griffins
VS-41 Shamrock

E-2C *Hawkeye*

The E-2C is the Navy's all-weather, carrier-based tactical warning and control system aircraft. It provides airborne early warning and command and control functions for the battle group. Additional missions include: surface surveillance coordination, strike and interceptor control, search and rescue guidance and communications relay.

Photo by MCSN Kristopher Wilson

▲ S-3B *Viking*

Wingspan: 80 ft., 7 in.
Length: 57 ft., 8.75 in.
Height: 18 ft., 3.75 in.
Weight: 53,288 lbs. maximum takeoff
Speed: 389 mph
Ceiling: 37,000 ft.
Range: 1,541 nm (ferry range)
Crew: 5 (2 pilots, 3 mission systems operators)

SQUADRONS

VAW-77(USNR) Night Wolves

Photo by MCSN Stephen W. Rowe

▲ E-2C *Hawkeye*

VAW-112 Golden Hawks
VAW-113 Black Eagles
VAW-115 Liberty Bells
VAW-116 Sun Kings
VAW-117 Wallbangers
VAW-120 Greyhawks
VAW-121 Bluetails
VAW-123 Screwtops
VAW-124 Bear Aces
VAW-125 Tigertails
VAW-126 Seahawks

C-2A Greyhound

The C-2A is the principal aircraft used for COD (carrier on-board delivery) of personnel and materiel. It can deliver a payload of up to 10,000 lbs.

Wingspan: 80.5 ft.
Length: 57 ft., 10 in.
Height: 15 ft., 10.5 in.
Weight: 57,000 lbs. maximum takeoff
Speed: 310 mph
Ceiling: 33,500 ft.
Range: more than 1,040 nm (with freight)
Crew: 3 (1 pilot, 1 co-pilot, 1 flight engineer)

SQUADRONS

VRC-30 Providers
VRC-40 Rawhides

SHORE-BASED

E-6B Mercury

The E-6B *Mercury* aircraft provides a survivable communications link between national decision makers and the country's arsenal of strategic nuclear weapons. The E-6B enables the President of the United States and the Secretary of Defense to directly contact submarines, bombers and missile silos protecting our national security through deterrence.

Wingspan: 148 feet, 2 inches
Length: 152 feet, 11 inches
Height: 42 feet 5 inches
Weight: 341,000 lbs. maximum take-off
Speed: 523 mph
Ceiling: 42,000 feet
Range: more than 5,500 nm
Crew: 23

SQUADRONS

VQ-3 Ironman
VQ-4 Shadows
VQ-7 Roughnecks

P-3C Orion/EP-3E Aries II

The P-3C and EP-3E, land-based, long-range patrol aircraft, have been in the Navy since the l960s. The P-3C's primary mission is anti-submarine warfare (ASW). Both the EP-3E and P-3C provide multi-mission intelligence, surveillance, reconnaissance and combat capability to theater commanders worldwide.

Wingspan: 99 ft., 8 in.
Length: 116 ft., 10 in.
Height: 33 ft., 8.5 in.
Weight: 142,000 lbs. maximum permissible
Speed: 466 mph
Ceiling: 28,300 ft.
Range: 1,346 nm mission radius with three hours on station
Armament: *Harpoon*, *Maverick*, *SLAM-ER*; torpedoes; bombs; mines. The EP-3E has no armament capability.
Crew (PC-3): 11 (3 pilots, 1 tactical coordinator, 1 navigator/communicator, 2 flight engineers, 3 sensor operators, 1 in-flight technician)
Crew (EP-3E): 24 (3 pilots, 3 naval flight officers, 2 flight engineers, 1

Photo by MC2 Aaron Burden

▲ A C-2 *Greyhound*

▼ E-6B *Mercury*

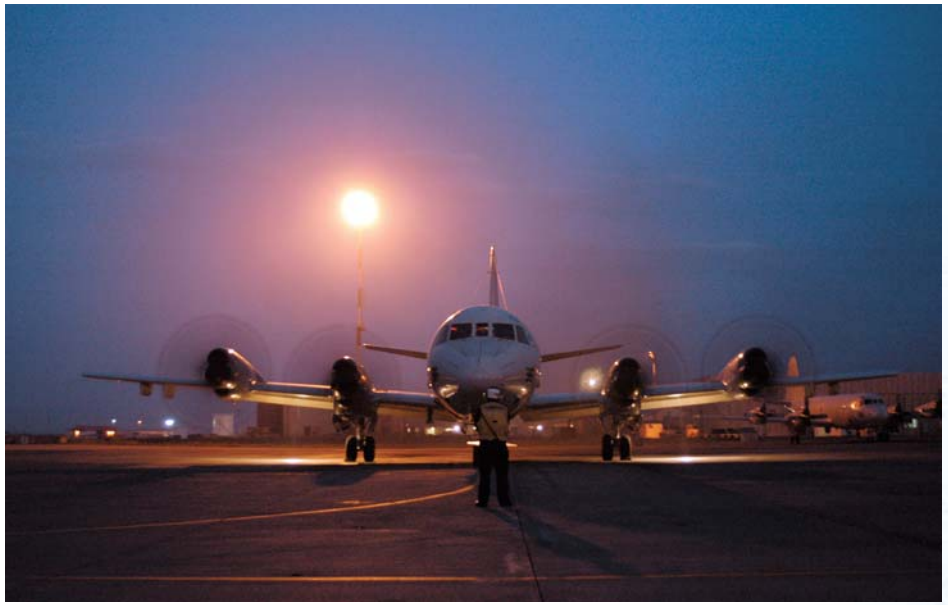
U.S. Navy photo

communications evaluator, 1 in-flight technician, 14 signals intelligence operators)

SQUADRONS

VP-1 Screaming Eagles
VP-4 Skinny Dragons
VP-5 Mad Foxes
VP-8 Tigers
VP-9 Golden Eagles
VP-10 Red Lancers
VP-16 War Eagles
VP-26 Tridents
VP-30 Pro's Nest
VP-40 Fighting Marlins
VP-45 Pelicans
VP-46 Grey Knights
VP-47 Golden Swordsmen
VP-62(USNR) Broad Arrows
VP-69(USNR) Totems
VP-92(USNR) Minutemen
VQ-1 World Watchers
VQ-2 Sandeman
VPU-1 Old Buzzards
VPU-2 Wizards

Photo by MC1 John Collins



▲ P-3C *Orion*

C-130T *Hercules*

The C-130T provides airlift for high priority over- and out-sized cargo.

Wingspan: 132 ft., 7 in.
Length: 97 ft., 9 in.
Height: 38 ft., 10 in.
Weight: 175,000 lbs. maximum takeoff
Speed: 400 mph maximum
Ceiling: 28,000 ft.
Range: 4,460 nm
Crew: 4 (2 pilots, 1 flight engineer, and 1 loadmaster)

SQUADRONS

VR-53 (USNR) Capital Express
VR-54 (USNR) Revelers
VR-55 (USNR) Minutemen
VR-64 (USNR) Condors

Photo by MC2 Jason T. Poplin

▲ C-130T *Hercules*

C-9B/DC-9 *Skytrain II*

The C-9B is used for fleet logistics support and military sealift.

Wingspan: 93 ft., 5 in.
Length: 119 ft., 3.5 in.
Height: 27.5 ft.
Weight: 111,000 lbs. maximum takeoff
Speed: .84 Mach maximum
Range: 1,450 nm with 90 passengers or 20,000 lbs. of cargo
Crew: 5 (2 pilots, 1 crew chief, 1 loadmaster, 1 transport safety specialist)

SQUADRONS

VR-46(USNR) Eagles
VR-52(USNR) Taskmasters
VR-56(USNR) Globemasters
VR-61(USNR) Islanders

C-40A *Clipper*

The C-40A *Clipper* provides critical logistics support to the Navy. Its flight deck features a flight management computer system with an integrated GPS.

The U.S. Navy Reserve, which operates and maintains the aircraft, is the first customer for the newest member of the Boeing Next-Generation 737 family. The *Clipper* was ordered by the Navy to replace its fleet of aging C-9B *Skytrains*. The C-40A is the first new logistics aircraft in 18 years to join the Navy Reserve. Currently, the Navy Reserve provides 100 percent of the Navy's worldwide in-theater medium and heavy airlift.

Wingspan: 112 ft., 12 in.
Length: 110 ft., 4 in.
Height: 41 ft., 2 in.
Weight: 171,000 lbs. maximum take-off
Speed: .82 Mach maximum
Ceiling: 41,000 ft.

Range: 3,000 nm with 121 passengers or 36,000 lbs. of cargo.
Crew: 6 (2 pilots, 1 crew chief, 1 loadmaster, 2 transport safety specialist)

SQUADRONS

VR-57 (USNR) Conquistadors
VR-58 (USNR) Sunseekers
VR-59 (USNR) Lonestar Express

C-12 *Huron*

The UC-12B/F/M *Huron* is a utility transport, equipped with high floatation landing gear and tip tanks. The UC-12F and UC-12M models also have hydraulically retractable landing gear.

Wingspan: 54 ft., 6 in.
Length: 43 ft., 9 in.
Height: 15 ft.
Weight: 12,500 lbs. maximum takeoff
Speed: 298 mph maximum
Ceiling: more than 35,000 ft.
Range: 1,965 nm
Crew: 3 (2 pilots or 1 pilot/1 naval flight officer and 1 loadmaster)

C-20A/D

The C-20A and C-20D are *Gulfstream III* variant used for executive transport.

Wingspan: 77 ft., 10 in.
Length: 83 ft., 2 in.
Height: 24 ft., 6 in.
Weight: 69,700 lbs. maximum takeoff
Speed: .85 Mach
Ceiling: 45,000 ft.
Range: 3,500 nm
Crew: 4-5 (2 pilots, 1 crew chief, 1 transport safety specialist and 1 optional communications system operator – depending upon JEMPRS system in use)

SQUADRONS

ETD Sigonella (USNR) (C-20A)
VR-1 (USNR) Starlifters (C-20D)

▼ C-40A *Clipper*

Photo by MC3 Ryan C. McGinley

C-20G

The C-20G is a *Gulfstream IV* variant with a cargo door providing long-range, medium lift capability.

Wingspan: 77 ft., 10 in.
Length: 88 ft., 4 in.
Height: 24 ft., 6 in.
Weight: 73,200 lbs. maximum takeoff
Speed: .88 Mach
Ceiling: 45,000 ft.
Range: 4,400 nm
Crew: 4 (2 pilots, 1 crew chief and 1 loadmaster)

SQUADRONS

VR-48 (USNR) Skyliners
VR-51 (USNR) Windjammers

C-37

The C-37A/B is a *Gulfstream* 5/550 respectively, providing executive transport to SECNAV, CNO, CMC, VCNO, ACMC, CFFC and DNNP.

Wingspan: 93 ft., 6 in.
Length: 96 ft., 5 in.
Height: 25 ft., 11 in.
Weight: 90,500 lbs. (C-37A)/91,000 lbs (C-37B) maximum takeoff
Speed: .885 Mach
Ceiling: 51,000 ft.
Range: 6,500 nm (C-37A)/6,750 nm (C-37B)
Crew: 4/5 (2 pilots, 1 crew chief, 1 transport safety specialist and 1 optional communications system operator-depending upon the JEMPRS system in use)

SQUADRONS

ETD Pacific (USNR) (C-37A)
VR-1 (USNR) Starlifters (C-37B)

HELICOPTERS

SH-60F/HH-60H *Seahawk*

The *Seahawk* is a twin-engine helicopter used for anti-submarine warfare, search and rescue, anti-surface warfare, cargo lift and special operations. The SH-60F is a carrier-based ASW platform. The HH-60H conducts combat search and rescue and SOF support missions. Some HH-60Hs

Photo by MC1 Bart A. Bauer

▲ **HH-60H *Seahawk***

have been modified for the air ambulance and air assault roles in support of Operation *Iraqi Freedom.*

Length: 40 ft., 11 in. (rotors and tail pylon folded)
Height: 17 ft.
Weight: 21,884 lbs. maximum takeoff
Speed: 169 mph
Range: 380 nm
Crew: 3-4

SQUADRONS

HS-2 Golden Falcons
HS-3 Tridents
HS-4 Black Knights
HS-5 Nightdippers
HS-6 Indians
HS-7 Dusty Dogs
HS-8 Eight-ballers
HS-10 War Hawks
HS-11 Dragonslayers
HS-14 Chargers
HS-15 Red Lions
HS-75 (USNR) Emerald Knights
HCS-4 (USNR) Red Wolves
HCS-5 (USNR) Firehawks

SH-60B/MH-60R

The HSL community is transitioning to the HSM community and has achieved IOC for the new aircraft in December 2005. The MH-60R will continue the legacy SH-60B mission of conducting ASW and ASUW from the decks of cruisers, destroyers and frigates and also deploy as a carrier-based squadron. The MH-60R adds a dipping sonar, multi-mode ISAR radar, enhanced ESM, EO/IR, self-defense suite digital torpedos and air-to-ground weapons.

Length: 40 ft., 11 in. (rotors and tail pylon folded)
Height: 17 ft.
Weight: 22,500 lbs. maximum takeoff
Speed: 200 mph
Range: 380 nm
Crew: 3

SQUADRONS

HSL-37 Easy Riders
HSL-40 Airwolves
HSL-41 Seahawks (MH-60R)
HSL-42 Proud Warriors
HSL-43 Battle Cats
HSL-44 Swamp Foxes
HSL-45 Wolfpack
HSL-46 Grandmasters
HSL-47 Saberhawks
HSL-48 Vipers
HSL-49 Scorpions
HSL-51 Warlords
HSL-60(USNR) Jaguars
HSM-71 (MH-60R)

MH-60S *Knighthawk*

The MH-60S is a twin-engine helicopter used for logistics support, vertical replenishment, search and rescue, naval special warfare support and future missions to include organic airborne mine countermeasures and combat search and rescue.

Length: 41 ft., 4 in.
Height: 17 ft.
Weight: 22,500 lbs. maximum takeoff
Speed: 200 mph
Range: 250 nm
Ceiling: 13,000 ft.
Crew: Four

SQUADRONS

HSC-2 Fleet Angels
HSC-3 Pack-Rats
HSC-25 Island Knights
HSC-26 Chargers
HSC-28 Dragon Whales
HSC-21 Blackjacks

H-3 *Sea King*

The first version of this workhorse anti-submarine warfare helicopter was flown more than 38 years ago. The H-3's versatility was emphasized during *Operation Desert Shield/Desert Storm* when 36 *Sea Kings*, flying from carriers,

logged more than 5,000 hours conducting combat SAR, special operations, maritime interdiction operations, logistics support and mine hunting. The SH-3H has been replaced in the fleet by SH-60F and HH-60H aircraft. The UH-3Hs are programmed to be replaced by the CH-60 version of the Sikorsky *Blackhawk/Seahawk*.

Length: 72 ft., 8 in.
Height: 16 ft., 10 in.
Weight: 21,000 lbs. maximum takeoff
Speed: 166 mph
Ceiling: 14,700 ft.
Range: 542 nm

Photo by MC2 Steven J. Weber

▲ MH-53E *Sea Dragon*

Armament: MK46/50 torpedoes, 7.62mm machine guns
Crew: 3-4

SQUADRONS

HSC-21 Blackjacks
HC-85 (USNR) Golden Gators

MH-53E *Sea Dragon*

The MH-53E, a mine-countermeasures derivative of the CH-53E *Super Stallion*, is heavier and has a greater fuel capacity than the *Super Stallion*. Capable of transporting up to 55 troops, the MH-53E can carry a 16-ton payload 50 nautical miles, or a 10-ton payload 500 nautical miles. In its primary mission of airborne mine countermeasures, the MH-53E is capable of towing a variety of mine-countermeasures systems.

Length: 99 ft. (rotors turning)
Height: 29 ft., 5 in. (tail rotor turning)
Weight: 73,500 lbs. maximum takeoff
Speed: 196 mph
Ceiling: 18,500 ft.
Range: 1,120 nm
Crew: 3 to 8 (2 pilots, 1 to 6 crewmen)

SQUADRONS

HC-4 Black Stallions
HM-14 (USNR) Vanguard
HM-15 (USNR) Blackhawks

Photo by Jeff Doty

▲ T-6A *Texan II*

UNMANNED AIRCRAFT SYSTEMS
RQ-2A *Pioneer* Unmanned Aerial Vehicle (UAV)

The *Pioneer* UAV system performs a wide variety of reconnaissance, surveillance, target acquisition and battle damage assessment missions. The UAV's low radar cross section, low infrared signature and remote control versatility provides a degree of cover for the aircraft. *Pioneer* provides the tactical commander with real-time images of the battlefield or target. Since first deployed as a land-based system in 1986, *Pioneer* is currently configured for operations on five LPD-class ships with a sixth ship under modifications.

The documented success of *Pioneer* in supporting combat operations and providing the battlefield commander critical intelligence information established the utility and importance of UAVs in combat.

Wingspan: 16.9 ft
Length: 14.0 ft
Weight: 416 lbs. maximum design gross take-off
Speed: 109.37 mph
Ceiling: 15,000 ft.
Range: 100+ nm

TRAINERS
T-6A *Texan II*

The T-6A *Texan II* is a tandem-seat, turboprop trainer whose mission is to train Navy and Marine Corps pilots and Naval Flight Officers.

The aircraft is one component of the Joint Primary Aircraft Training System (JPATS) along with simulators, computer-aided academics, and a Training Integration Management System (TIMS). The joint program, that will replace Navy T-34C aircraft, uses commercial-off-the-shelf (COTS) subsystems to the maximum extent possible. The Navy's total T-6A requirement is 315 aircraft. The Navy

aircraft and ground-based training systems will be completely supported and maintained by commercial vendors with intermediate maintenance provided for selected systems at the operating site.

Wingspan: 33.4 feet
Length: 33.3 feet
Height: 10.8 feet
Weight: 6,500 lbs. maximum takeoff weight
Speed: 270 knots
Range: 850 nm (max)
Ceiling: 31,000 feet
Crew: 2 (instructor pilot, student pilot)

▼ T-34C *Turbomentor*

Photo by Sheri L. Crowe

SQUADRONS

VT-4 Mighty Warbucks
VT-10 Wildcats

T-34C *Turbomentor*

The T-34C is used to provide primary flight training for student pilots. As a secondary mission, approximately 10 percent of the aircraft provide pilot proficiency and other aircraft support services to Commander, Naval Air Force, U.S. Atlantic Fleet; Commander, Naval Air Force, U.S. Pacific Fleet; and Naval Air Systems Command's "satellite sites" operated throughout CONUS. The T-34C was procured as a commercial-derivative aircraft certified under an FAA Type Certificate. Throughout its life, the aircraft has been operated and commercially supported by the Navy using FAA processes, procedures and certifications.

Wingspan: 33 ft., 5 in.
Length: 28 ft., 8 in.
Height: 9 ft., 11 in.
Weight: 4,425 lbs.
Speed: 322 mph
Ceiling: 25,000 ft.
Range: Approx. 600 nm
Crew: 2 (instructor pilot, student pilot)

SQUADRONS

VT-2 Doer Birds
VT-3 Red Knights
VT-6 Shooters

Photo by MC2 Daniel J. McLain

▲ T-2C *Buckeye*

VT-27 Boomers
VT-28 Rangers

T-45A/C *Goshawk*

The T-45A, the Navy version of the British Aerospace *Hawk* aircraft, is used for intermediate and advanced portions of the Navy/Marine Corps pilot training program for jet carrier aviation and tactical strike missions. The T-45 includes an integrated training system that includes the aircraft, operations and instrument fighter simulators, academics and training integration system. There are two versions of T-45 aircraft currently in operational use at this time, the T-45A and T-45C derivatives. The T-45A which became operational in 1991, contains an analog design cockpit while the new T-45C (delivery began in 1997) is built around a new digital "glass cockpit" design.

Wingspan: 30 ft., 9.75 in.
Length: 39 ft., 4 in.
Height: 14 ft.
Weight: 14,081 lbs. maximum takeoff
Speed: 625 mph
Range: 826 nm
Ceiling: 40,000 ft.
Crew: 2 (instructor, student)

SQUADRONS

VT-7 Eagles
VT-9 Tigers
VT-21 Redhawks
VT-22 Golden Eagles

T-2 *Buckeye*

The T-2 is a tandem two-seat, carrier capable, all purpose jet whose mission is to train Navy and Marine Corps flight officers in advanced tactical maneuvering phase of training.

Wingspan: 38 ft., 1.5 in.
Length: 38 ft., 3.5 in.
Height: 14 ft., 9.5 in.
Weight: 13,179 lbs. maximum takeoff
Speed: 522 mph
Range: 909 nm
Ceiling: 40,400 ft.
Crew: 2 (1 instructor, 1 student)

SQUADRONS

VT-86 Sabre Hawks

T-44A *Pegasus*

The T-44A is used to train Navy and Air Force pilots to fly multi-engine, turbo-prop aircraft such as the P-3 and the C-130.

Wingspan: 45 ft., 10.75 in.
Length: 39 ft., 9.5 in.
Height: 15 ft., 1.75 in.
Weight: 10,950 lbs. maximum takeoff
Speed: 267 mph
Range: 960 nm
Ceiling: 31,000 ft.
Crew: 2 (1 instructor, 1 student)

SQUADRON

VT-31 Wise Owls
VT-35 Stingrays

T-39N/G *Sabreliner*

The T-39N *Sabreliner* is a multi-purpose, low-wing, twin-jet aircraft. The 14 T-39Ns – derivatives of the commercial *Sabre* model 265-40 – are used for training undergraduate military flight officer students in radar navigation and airborne radar-intercept procedures. The eight T-39Gs – derivatives of the commercial *Sabre* model 265-60 - are used for student non-radar training.

Wingspan: 44 ft., 5.25 in.
Length: 48 ft., 4 in.
Height: 16 ft.
Weight: 20,000 lbs. maximum takeoff
Speed: Mach .8
Range 1,777 nm
Ceiling: 27,000 ft.
Crew: 2 (1 instructor, 1 student)

SQUADRON

VT-4 Mighty Warbucks
VT-10 Wildcats
VT-86 Sabre Hawks

TH-57 *Sea Ranger*

The TH-57 *Sea Ranger* is a derivative of the commercial Bell *Jet Ranger* 206 and its primary mission is to provide advanced rotary-wing training to Navy and Marine Corps pilots The TH-57 has two variants – TH-57B and TH-57C models. The TH-57B is used for primary visual flight rules training and the TH-57C is used for advanced instrument flight rules training.

Length: 39 ft.
Height: 10 ft.
Weight: 3,200 lbs. maximum takeoff
Speed: 138 mph

Photo by MC3 Joseph M. Buliavac

▲ TH-57 *Sea Ranger*

Ceiling: 20,000 ft., pressure altitude
Range: 368 nm
Crew: 5 (1 pilot, 4 student pilots)

SQUADRON

HT-8 Eightballers
HT-18 Vigilant Eagles

SPECIAL SQUADRONS

VC-6 Firebees
VX-1 Pioneers
VX-9 Vampires
TACRON-11 Dirigimi
TACRON-12 Talons
TACRON-21 Blackjacks
TACRON-22 Skylords

(Source: OPNAV N-88)

COMMANDER NAVAL SPECIAL WARFARE COMMAND, CORONADO, CALIF.

Commander, Naval Special Warfare Group (NSWG) 1, Coronado, Calif.
- SEAL Teams 1/3/5/7
- Logistics Support Unit, Coronado, Calif.
- Naval Special Warfare Unit (NSWU) 1, Guam
- Naval Special Warfare Unit (NSWU) 3, Bahrain

Commander, Naval Special Warfare Group (NSWG) 2, Little Creek, Va.
- SEAL Teams 2/4/8/10
- Logistics Support Unit, Little Creek, Va.
- Naval Special Warfare Unit (NSWU) 2, Germany
- Naval Special Warfare Unit (NSWU) 10, Spain

Commander, Naval Special Warfare Group (NSWG) 3, Coronado, Calif.
- SEAL Delivery Vehicle Team (SDVT) 1, Pearl City, Hawaii
- SEAL Delivery Vehicle Team (SDVT) 2, Little Creek, Va.

Commander, Naval Special Warfare Group (NSWG) 4, Little Creek, Va.
- Special Boat Team (SBT) 12, Coronado, Calif.
- Special Boat Team (SBT) 20, Little Creek, Va.
- Special Boat Team (SBT) 22, Stennis, Miss.

Naval Special Warfare Center (NSWC), Coronado, Calif.
- Naval Small Craft Instruction and Technical Training School (NAVSCIATTS), Stennis, Miss.
- Naval Special Warfare Advanced Training Command, Coronado, Ca.
- Navy Parachute Team "Leap Frogs," Coronado, Ca.
- Naval Special Warfare Recruiting Directorate, Coronado, Ca.

Commander, Naval Special Warfare Operational Support Group (Reserve Force)
- Operational Support Team (OST) 1, Coronado, Calif.
- Operational Support Team (OST) 2, Little Creek, Va.
- 59 Operational Support Units throughout the U.S.

Commander, Naval Special Warfare Development Group, Dam Neck, Va.

(Source: Naval Special Warfare Command Active-duty Force as of Jan. 1, 2007)

Photo by MC1(AW) Brien Aho

▲ Sailors assigned to Naval Small Craft Instruction and Technical Training School (NAVSCIATTS) train personnel from the Iraqi Riverine Police Force on special boat maneuvers and weapon handling during a six-week patrol craft course at Stennis Space Center, Miss.

STRATEGIC STRIKE

Trident II (D-5)

Larger and with longer range than the *Trident I*, the *Trident II* was first tested aboard a submarine in March 1989 and deployed in 1990.

Dimensions: 83 x 528 in.
Weight: 130,000 lbs.
Warhead: Designed to carry 12 W76/MK 4 or eight W88/MK 5
Propulsion: Solid-fuel rocket
Range: 4,000 nm.

▼ Laser Guided Bomb Unit-12 (GBU-12) and two GPS Guided Bombs Unit-38 (GBU-38)

Photo by MC2 Miguel Angel Contreras

GENERAL-PURPOSE BOMBS

The MK-80 series general-purpose bomb family was created in the late 1940s and has been the standard air-launched bomb for the services ever since. The general-purpose bomb family is designed to provide blast and fragmentation effects and is used extensively in a number of configurations including laser-guided bombs (LGBs), joint direct attack munitions (JDAM) and air-delivered mining applications. The unguided versions of the general-purpose bomb can also be delivered in freefall or retarded modes depending upon mission requirements.

There were four basic versions of these bombs in inventory for many years:

- 250 pound MK-81,
- 500 pound MK-82/BLU 111
- 1,000 pound MK-83/BLU 110 and
- 2,000 pound MK-84/BLU 117.

Production of the 250-pound general-purpose bomb has been discontinued and it is no longer carried in the active inventory. The remaining versions of the MK-80 series bombs are being converted from the MK designation to the bomb-loaded unit (BLU) designation during new production. The Navy's MK-80 series bombs remaining in inventory are filled with H-6 high explosive; the newer BLU series bombs incorporate a PBXN-109 explosive that provides less sensitive characteristics and is considered safer to handle and stow.

Laser-Guided Bomb (LGB) Kits

Laser-guided bomb kits were developed to enhance the terminal accuracy of air-launched, general-purpose bombs and entered the fleet's inventory in 1968. An LGB kit consists of a Computer Control Group and Air Foil Group. The kit is normally attached to a general-purpose bomb to form an LGB.

Joint Direct Attack Munition (JDAM)

Joint direct attack munitions kits were jointly developed with the U.S. Air Force to provide increased accuracy for air-launched bombs. The JDAM kit consists of a tail kit and mid-body strakes attached to a general purpose or penetrator bomb body. Guidance and control is provided by global positioning system aided inertial navigation system.

Dimensions: (JDAM and warhead) GBU-31 (v) 2/B: 152.7 inches; GBU-31 (v) 3/B: 148.6 inches; GBU-32 (v) 2/B: 119.5 inches
Weight: (JDAM and warhead) GBU-31 (v) 2/B: 2,036 pounds; GBU-31 (v) 3/B: 2,115 pounds; GBU-32 (v) 2/B:

1,013 pounds
Wing Span: GBU-31: 25 inches; GBU-32: 19.6 ins.
Range: Up to 15 miles

Joint Stand-off Weapon (JSOW)

The joint standoff weapon is an air-launched "drop-and-forget" weapon that is capable of approximately 40 nautical mile stand-off ranges. JSOW provides the fleet with a strike interdiction capability against soft targets such as fixed and relocatable air defense elements, parked aircraft command and control facilities, light combat vehicles, industrial elements and enemy troops. Currently, two variants of JSOW are planned: AGM-154A, that uses general-purpose submunitions and JSOW C that employs a unitary type warhead.

Dimensions: 160 inches; box shaped diameter 13 inches on a side; 106 inches wingspan
Weight: From 1,065 pounds to 1,500 pounds
Range: Low altitude launch - 15 nautical miles, High altitude launch – 65 nautical miles
Warhead(s): BLU-97 – Combined effects bomblets, BLU-108 – Sensor fused weapon, Broach multi-stage warhead

HARM (High-Speed Anti-Radar Missile)

HARM is the standard anti-radar missile in the U.S. inventory. It's used as both a strike-protection and anti-ship weapon. First deployed aboard USS *Kitty Hawk* (CV 63) in January 1984. First used in combat in April 1986 during raids on Libya.

Dimensions: 13 ft., 8 in.
Diameter: 10 in.
Wingspan: 3 ft., 8 in.
Weight: 800 lbs.
Speed: 760 plus mph.
Warhead: 146 lbs.
Range: Depends on launch speed/altitude
Propulsion: Dual-thrust rocket motor (Mach 2+)

HARPOON/SLAM-ER

The *Harpoon* and Stand-Off Land Attack Missile – Expanded Response (SLAM-ER) missiles are derivatives from the original Harpoon, which was conceived in 1965.

Harpoon

Air, surface-launched, anti-ship, all-weather cruise missile. Originally designed as an air-to-surface missile for the P-3 *Orion*, the *Harpoon*, which entered service in 1977, can now be carried by virtually all naval platforms.

Dimensions: 12.6 ft. long-air launched; 15.2 ft. long-surface launched.
Weight: 1,160 lbs. (air launch), 1,459 lbs. (ASROC launcher), 1,520 lbs. (SAM launcher), 1,523 lbs. (capsule/canister launch)

Photo by MCSN Chris M. Valdez

▲ AGM-88 *High-Speed Anti-Radiation Missile (HARM)*

Speed: High subsonic speeds
Warhead: 488.5 lbs. HE (blast; semi-armor piercing)
Propulsion: Turboject (cruise) w/solid-fuel booster for ship launch
Range: 75 nm.

Stand-Off Land Attack Missile-Expanded Response (SLAM-ER)

SLAM-ER is an upgrade to the SLAM and is currently in production. *SLAM-ER* has a greater range (150+ miles), a titanium warhead for increased penetration and software improvements which allow the pilot to retarget the impact point during the terminal phase of attack. It is also the first land-attack missile equipped with automatic target acquisition for precision targeting.

Maverick

The *Maverick* is a short-range, air-to-surface, tactical missile. The version used by the Navy carries a warhead designed to penetrate large, hard targets. First deployed in August 1972.

Dimensions: 8.2 ft. long; 12 in. diameter; 2.4 ft. wing span
Weight: 635 lbs.
Warhead: 300 lbs.
Propulsion: Two-stage, solid-fuel rocket motor
Speed: Supersonic
Range: Approx. 14 nm.

Tomahawk Cruise Missile

An all-weather, ship- or submarine-launched, cruise missile. *Tomahawks* have proven to be highly survivable weapons due to their low radar detectability and terrain/wave-skimming flight. First deployed in 1986.

Dimensions: 18.3 ft. long (20.6 ft. with booster); 20.4 in. diameter; 8.9 ft.

U.S. Navy photo

▲ Tactical *Tomahawk* Cruise Missile

wingspan
Weight: 2,650 lbs. (3,200 lbs. with booster)
Warhead: 1,000 lbs. (conventional) or conventional submunitions dispenser with combined-effect bomblets
Propulsion: Turbojet (cruise); solid-fuel booster (launch)
Speed: Subsonic
Range: 870 nm. (land attack/ conventional warhead)

Penguin Anti-ship Missile

The Norwegian-designed and built *Penguin* anti-ship missile is carried aboard Lamps III helicopters. First deployed in 1993.

Dimensions: 10 ft long; 11.2 in. diameter; 39 in. wingspan
Weight: 847 lbs.
Propulsion: Solid-fuel rocket motor/solid-fuel booster
Warhead: 265 lbs., semi-armor piercing
Range: 25 nm.
Speed: Mach 1.2

ANTI-AIR WARFARE (AAW) AIRCRAFT GUNS

M61A1

This 20mm Gatling gun, which also forms the basis for the *Phalanx* Close-In Weapons System (see "Anti-aircraft Warfare" section), is mounted aboard the F/A-18 *Hornet*.

Caliber: 20mm//62
Muzzle Velocity: 3,400 ft./sec.
Rate of Fire: 4,000 or 6,000 rounds/min.
Weight: 841 lbs. total (gun, feed system, ammunition)

SURFACE-TO-AIR MISSILES

Rolling Airframe Missile (RAM)

Developed jointly with the Federal Republic of Germany, RAM provides ships with a low-cost, self-defense system against anti-ship missiles.

Dimensions: 9.25 ft. long; 5 in. diameter; 1.5 ft. wingspan
Weight: 162 lbs.
Warhead: 25 lbs.
Propulsion: Solid-fuel rocket
Range: 5 nm.
Speed: Supersonic

STANDARD MISSILE-2 (SM-2)

Designed as a surface-to-air and surface-to-surface missile, the Standard missile is currently employed in two variations: SM-2 MR (medium range) and SM-2 ER (Extended Range).

The first *Standard* missile entered the fleet in 1970. The SM-2 ER arrived in 1981.

SM-1/SM-2 MR

Dimensions: 14.7 ft. long; 13.5 in. diameter; 3.6 ft. wingspan
Weight: 1,380 lbs.
Warhead: Proximity fuse/high-explosive
Propulsion: Dual thrust/solid-fuel rocket
Range: 40 to 90 nm.

SM-2 ER

Dimensions: 26.2 ft long; 13.5 in. diameter; 5.2 ft. wingspan
Weight: 2,980 lbs.
Warhead: Proximity fuse/ high-explosive
Propulsion: Two-stage/solid-fuel rocket; sustainer motor and booster motor
Range: 65 to 100 nm.

AIR-TO-AIR MISSILES

Advanced, Medium-Range, Air-to-Air Missile (AMRAAM)

An all-weather, all-environment, radar guided missile developed as a follow-on to the *Sparrow* missile series. AMRAAM is smaller, faster, lighter and has improved capabilities against very low-altitude and high-altitude targets in an electronic countermeasure environment. Its active radar, in conjunction with an inertial reference unit and microcomputer system makes the missile less dependent on the aircraft fire control system enabling the pilot to aim and fire several missiles at multiple targets. The AMRAAM is a result of a joint U.S. Navy and U.S. Air Force development effort and is in service with numerous NATO and Allied countries. The AMRAAM was deployed in September 1991 and is carried on the F/A-18 *Hornet*.

Dimensions: 12 ft. (long); 7 in. diameter; 21 in. wingspan
Weight: 335 lbs.
Propulsion: High performance, solid fuel rocket motor
Warhead: Blast fragmentation; high explosive
Speed: Supersonic

AIM-54 *Phoenix* Missile

The *Phoenix* missile is the Navy's

Photo by MC3 Kathleen Gorby

▲ ***Sea Sparrow*** **missile**

only long-range, air-to-air missile. The missile is designed for use in all-weather and heavy jamming environments. The improved *Phoenix*, the AIM-54C, can better counter projected threats from tactical aircraft and cruise missiles.

Dimensions: 13 ft. long; 15 in. diameter; 36 in. wingspan
Weight: 1,024 pounds
Propulsion: Solid propellant rocket motor
Warhead: 135 lb., proximity fuse, high explosive
Range: In excess of 100 nm.
Speed: In excess of 3,000 mph

Sparrow

A highly-maneuverable, all-weather, beyond-visual-range, semi-active radar homing air-to-air missile used by the United States, NATO and other allied forces. A shipboard version, the *Sea Sparrow*, provides U.S. Navy and NATO ships with an effective, anti-air weapon. First deployed in 1958, numerous models and upgrades have occurred to the *Sparrow* missile family. Current air-to-air versions are carried on the F-14 and F/A-18 aircraft.

Dimensions: 12 ft. long; 8 in. diameter; 3.4 ft. wingspan
Weight: 500 lbs.
Warhead: 88 lbs. annular blast fragmentation
Propulsion: Solid-fuel rocket motor
Speed: Supersonic

Sidewinder

The *Sidewinder* is a short-range, infrared, within visual range air-to-air missiles used by the United States, NATO and other allied nations. The missile has been through a number of modernizations and the current fleet weapon is the AIM-9M. The missile is an all-aspect, heat-seeking missile with improved capabilities against countermeasures. A major modification to the AIM-9M *Sidewinder* is the AIM-9X.

The AIM-9X is a joint U.S. Navy and U.S. Air Force program that upgrades the missile with a staring focal plan array in the seeker, and extremely agile airframe and state-of-the-art signal processors resulting in enhanced target acquisition, missile kinematics and improved infrared counter-countermeasure capabilities. The missile's high off boresight capability can be coupled to a helmet-mounted cueing system that will revolutionize the way that air-to-air missiles are employed. The Sidewinder is currently deployed on the F/A-18, AV-8 and AH-1 aircraft.

Dimensions: 9.6 ft. long; 5 in. diameter; 2.1 ft. wingspan
Weight: 190 lbs.
Propulsion: High performance, solid-fuel rocket motor
Warhead: 20.8 blast fragmentation
Speed: Supersonic

SHIPBOARD GUNS

MK-45 – 5-inch/54-caliber lightweight gun

This 54-caliber, lightweight gun provides surface combatants accurate naval gunfire against fast, highly-maneuverable, surface targets, air threats and shore batteries during amphibious operations.

Caliber: 5 inch/54 inch
Shell Weight: 70 lbs.
Firing Rate: 20 rounds per minute
Muzzle Velocity: 2,650 ft./sec
Range: 13 nm.
Magazine Capacity: 475 to 500 rounds
Weight: 47,820 lbs.

MK-38 – 25 mm machine gun system

The Navy version of the Army *Bushmaster*, or "Chain Gun." This single-barrel, air-cooled, heavy machine gun meets the needs of ships throughout the fleet, especially those operating in the Persian Gulf.

Caliber: 25mm/87
Round Weight: 1.1 lbs.
Muzzle Velocity: 1,100 m/sec
Range: 2,700 yds.
Type of Fire: Single shot; 175 rounds/min. in automatic

MK-75 – 76mm/62 caliber 3-inch gun

Best suited for use aboard smaller combat vessels, the MK-75 features rapid fire capability with low manning requirements. The gun was approved for fleet use in 1975 and was first deployed aboard USS *Oliver Hazard Perry* (FFG 7) in 1978.

Caliber: 3-inch/62
Firing Rate: 85 rounds/min.
Muzzle Velocity: 925 m/sec
Range: 10 nm.
Weight: 7.35 tons

Phalanx Close-In Weapons System (CIWS)

The *Phalanx* CIWS combines a 20mm Gatling gun with search and tracking radar to provide surface ships with terminal defense against anti-ship missiles. The system underwent operational tests and evaluation on board USS *Bigelow* (DD 942) in 1977 and went into production in 1978 with the first systems installed aboard USS *Coral Sea* (CV 43) in 1980. The original versions used rounds made from depleted uranium that have since been replaced by tungsten rounds.

Caliber: 20mm/53
Firing Rate: 1,000-3,000 rounds/min.
Muzzle Velocity: 3,650 ft./sec
Range: 6,000 yds.

60mm Mortar

Often combined with the M-60

Photo by MC2 Zack Baddorf

▲ MK-38 25mm Machine Gun

▼ AIM-9M *Sidewinder* Air-to-Air Missile

Photo by MC2 Yesenia Rosas

machine gun, the 60mm mortar is used aboard patrol boats (PBs).

Caliber: 60mm

Firing Rate: 10 rounds/min. (trigger mode); 18 rounds/min. (drop mode)

Muzzle Velocity: 500 ft./sec

Range: 1,850 to 2,000 yds.

ANTI-SUBMARINE WARFARE (ASW) TORPEDOES

MK-46

The MK 46 MOD 5A(S) torpedo achieved its initial operational capability and was introduced into the fleet in 1979. It can be launched from fixed and rotary wing aircraft and surface combatants VLA and torpedo tubes. Full-up MK 46 torpedoes are no longer being produced. In 1987, a major upgrade program enhanced the performance of the MK 46 Mod 5A(S) in shallow water.

A service life extension program was initiated in 1992 to extend the life of the MK 46 Mod 5A(S), convert it to the MK 46 Mod 5A(SW), and to provide additional shallow water and bottom avoidance modes. The MK 46 Mod 5A(SW) was introduced to the Fleet in 1996.

Dimensions: 8.5 ft. long, 12.75 in. diameter

Weight: 512 lb.

Range:: More than 8,000 yds.

Speed: 45 Knots

Propulsion: Two-speed, reciprocation external combustion

Warhead: 96 lbs. of PBXN-103

Depth: Greater than 1,200 ft.

MK-48

The MK-48 Torpedo is a long-range, high-speed, deep-depth, wire-guided acoustic homing weapon designed to combat diesel submarines, nuclear submarines and high-performance surface ships in all environments. Developed by the Applied Research Laboratory, Pennsylvania State University, and Westinghouse Electric Corporation, Baltimore, the MK-48 and its subsequent variants have been in service with the Navy since 1972.

In 1975 an operational requirement was issued by the CNO to develop modifications to the MK-48 to keep pace with threat advancements. This development effort was accelerated to neutralize the former Soviet Alpha submarine threat and resulted in the MK-48 MOD 4 that achieved Initial Operational Capability in 1980.

Additional efforts resulted in development of the digital advanced capability (ADCAP) MK-48 MOD 5 that is carried by *Los Angeles*, *Seawolf* and *Virginia*-class attack submarines and some *Ohio*-class ballistic missile submarines. The MK-48 MOD 5 became operational in 1988 and

Photo by MC3 Ramon Preciado

▲ MK-46 Mod 5 Torpedo

was approved for production a year later.

Although full-up torpedoes have not been produced since 1994, modifications (ADCAP MODS) produced by Northrup Grumman and Raytheon Systems Corporation have enhanced its countermeasure rejection capability, increased its guidance and control processing and memory and improved its shallow water capabilities. The newest variant is designated the MK-48 ADCAP MOD 7, Common Broadband Advanced Sonar System (CBASS).

Dimensions: 19 feet long, 21 in. diameter
Weight: 3,434 lbs. (MK-48) 3,695 (MK-48 ADCAP)
Range: Greater than 8 nm.
Speed: Greater than 28 Knots
Propulsion: Positive displacement Piston-type engine with OTTO fuel II
Warhead: Not given
Depth: Not given

MK-50

The MK-50 torpedo began low-rate initial production in 1987. The MK-50 can be launched from all ASW aircraft and from torpedo tubes aboard surface combatants. It is an advanced lightweight digital torpedo designed for use against faster, deeper-diving and more sophisticated submarines.

The stored chemical energy propulsion system develops full power at all depths and is capable of multi-speed operations required by the tactical situation. Although full-up torpedoes have not been produced since 1993, the Block I software upgrade program has enhanced the MK 50's shallow water and countermeasure capability. Also a new longer-lasting, safer and cheaper stored chemical energy propulsion system is currently being introduced.

Dimensions: 9.3 ft. long, 12.75 in. diameter
Weight: 750 lbs.
Range: In excess of 14,000 yds.
Speed: Multiple speeds with a top speed in excess of 40 knots
Propulsion: Close-cycle Stored Chemical Energy Propulsion System
Warhead: Approximately 100 lbs. high explosive shaped charge
Depth: 3,600 ft.

▼ MK-50 Torpedo

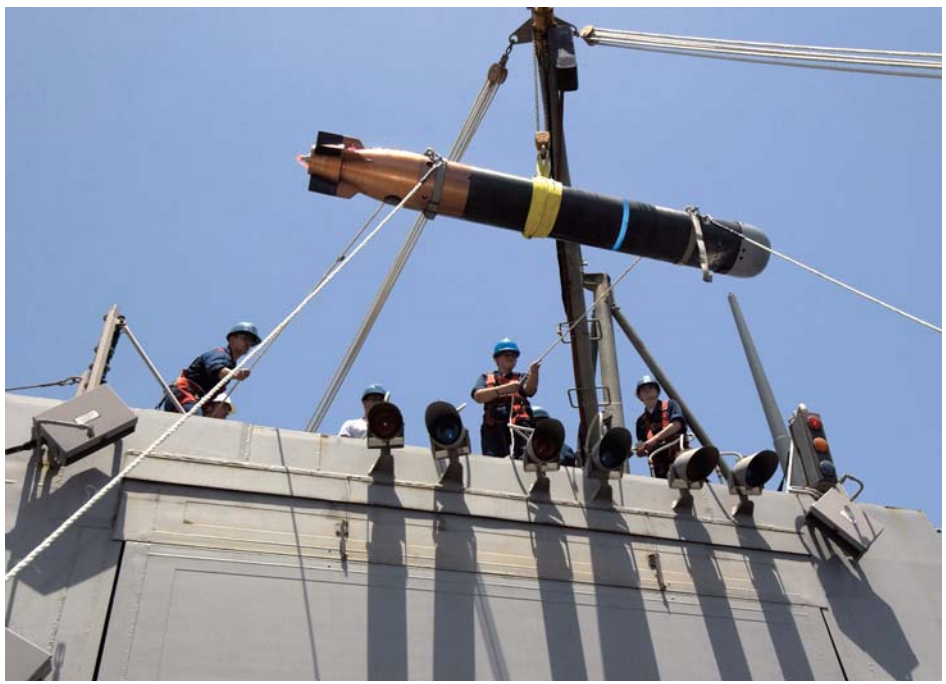


Photo by MC1(AW) Brien Aho

MINES

MK-67 Submarine Launched Mobile Mine (SLMM)

Based on the MK 37 torpedo, the SLMM is a submarine-deployed mine used for covert mining in hostile environments. The MK-67 began active service in 1987.

Type: Submarine-laid bottom mine.
Dimensions:13.4 ft. long; 19 in. diameter
Detection System: Magnetic/seismic target detection devices (TDDs)
Depth Range: Shallow water
Weight: 1,735 pounds
Explosives: 515 pounds of high explosive

MK-65 *Quickstrike*

The *Quickstrike* is a family of shallow-water, aircraft-laid mine used primarily against surface ships. The MK-65 mine is a thin-walled mine casing. MK-62 and MK-63 mines are converted, general-purpose bombs. All were approved for service use in the early 1980s.

Type: Aircraft-laid bottom mine.
Dimensions: MK-65 mine is 10.7 ft. long; 21 in. diameter (29 in. across fins; MK-62 and MK-63 mines vary in length depending on flight gear used
Detection System: Magnetic/seismic/ or magnetic/seismic/pressure target detection devices (TDDs) are used on various models.
Depth Range: Shallow water
Weight: MK-62, MK-63 and MK-65 are 500, 1,000 and 2,000 pound class respectively
Explosives: Various loads

Photo by MC3 Shannon R. Smith

▲ MK-65 *Quickstrike* Mine

MK-56

The MK-56 mine is primarily an ASW mine (the oldest still in use). It reached initial operating capability in 1962.

Type: Aircraft-laid, moored mine
Dimensions: 9.5 ft. long (without fairing); 23 in. diameter
Detection System: Total field magnetometer.
Depth Range: Intermediate water
Weight: 2,000-pound class
Explosives: 360 pounds of high explosive

Sources: N-85, N-86, N-87, N-88

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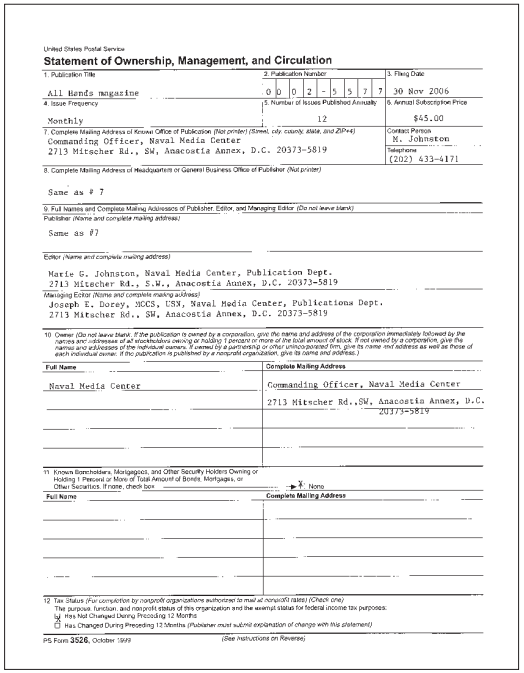

United States Postal Service
Statement of Ownership, Management, and Circulation

1. Publication Title	2. Publication Number	3. Filing Date
All Hands magazine	0 0 0 2 - 5 5 7 7	30 Nov 2006
4. Issue Frequency	5. Number of Issues Published Annually	6. Annual Subscription Price
Monthly	12	$45.00

7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4): Commanding Officer, Naval Media Center, 2713 Mitscher Rd., SW, Anacostia Annex, D.C. 20373-5819 — Contact Person: N. Johnston; Telephone: (202) 433-4171

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer): Same as # 7

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)
Publisher (Name and complete mailing address): Same as #7
Editor (Name and complete mailing address): Marie G. Johnston, Naval Media Center, Publication Dept. 2713 Mitscher Rd., S.W., Anacostia Annex, D.C. 20373-5819
Managing Editor (Name and complete mailing address): Joseph E. Dorey, MCCS, USN, Naval Media Center, Publications Dept. 2713 Mitscher Rd., SW, Anacostia Annex, D.C. 20373-5819

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Naval Media Center	Commanding Officer, Naval Media Center 2713 Mitscher Rd.,SW, Anacostia Annex, D.C. 20373-5819

11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box → X None

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12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)
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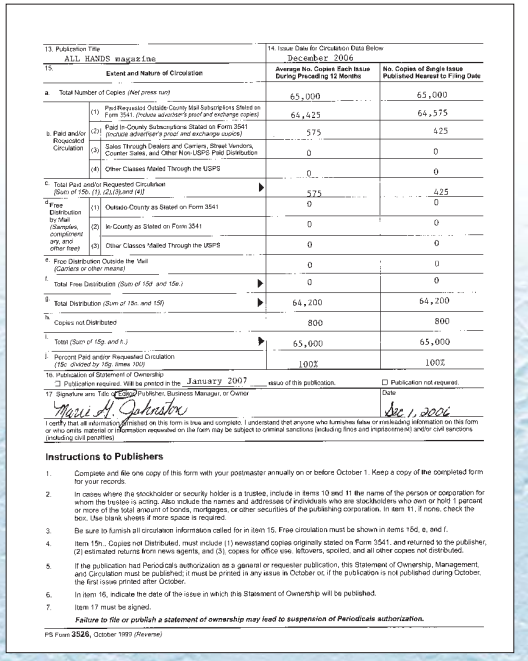
PS Form 3526, October 1999 (See Instructions on Reverse)



13. Publication Title: ALL HANDS magazine	14. Issue Date for Circulation Data Below: December 2006	
15. Extent and Nature of Circulation	Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)	65,000	65,000
b. Paid and/or Requested Circulation (1) Paid/Requested Outside-County Mail Subscriptions Stated on Form 3541. (Include advertiser's proof and exchange copies)	64,425	64,575
(2) Paid In-County Subscriptions Stated on Form 3541 (Include advertiser's proof and exchange copies)	575	425
(3) Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Non-USPS Paid Distribution	0	0
(4) Other Classes Mailed Through the USPS	0	0
c. Total Paid and/or Requested Circulation (Sum of 15b. (1), (2),(3),and (4))	575	425
d. Free Distribution by Mail (Samples, complimentary, and other free) (1) Outside-County as Stated on Form 3541	0	0
(2) In-County as Stated on Form 3541	0	0
(3) Other Classes Mailed Through the USPS	0	0
e. Free Distribution Outside the Mail (Carriers or other means)	0	0
f. Total Free Distribution (Sum of 15d. and 15e.)	0	0
g. Total Distribution (Sum of 15c. and 15f)	64,200	64,200
h. Copies not Distributed	800	800
i. Total (Sum of 15g. and h.)	65,000	65,000
j. Percent Paid and/or Requested Circulation (15c. divided by 15g. times 100)	100%	100%

16. Publication of Statement of Ownership
☐ Publication required. Will be printed in the January 2007 issue of this publication. ☐ Publication not required.

17. Signature and Title of Editor, Publisher, Business Manager, or Owner: Marie G. Johnston — Date: Dec 1, 2006

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